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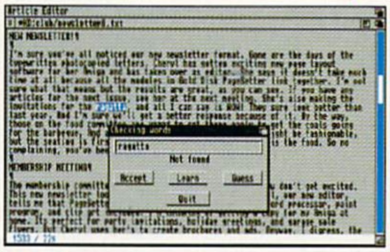
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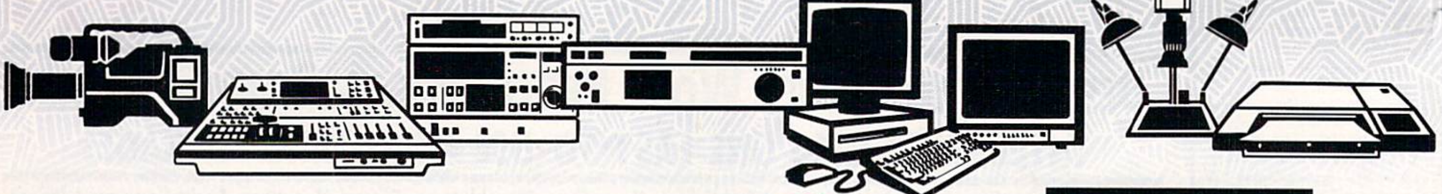
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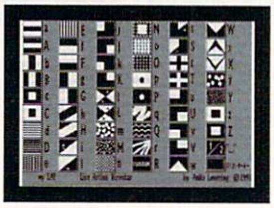
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Graphic Courtesy of Nickelodeon

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Like England's immensely popular "Zool" (above), British games have taken the lead in the Amiga market. Find out how you can get in on the international act. Plus an expanded Game review section, the '92 Top Ten domestic games, the year's best in PD games, and more—all in our Annual Games Special!

COVER PHOTOGRAPH BY EDWARD JUDICE
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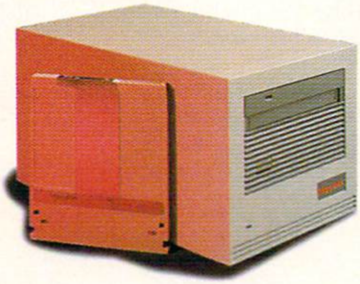
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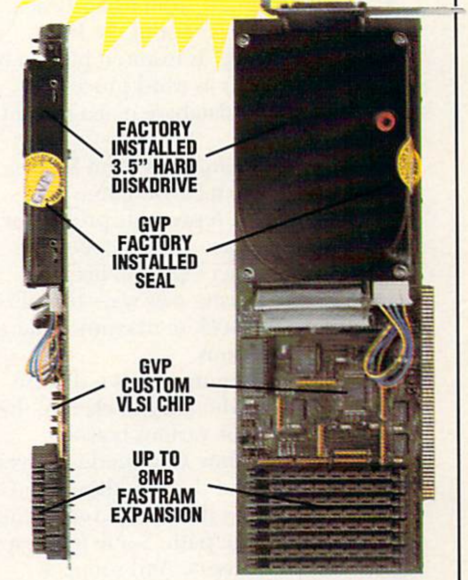
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EDITOR'S DRAWER

Life would be simpler for this magazine editor if there were only one kind of Amiga user interested in only one kind of application. But think how boring that market would be!

Vive la Difference!

• A 17-year-old high-school student dazzles his graphic art and design teacher (a Mac devotee) with the Amiga's animation and graphics capabilities.

• A 40-year-old father of three is attracted to the Amiga's potential as an educational and entertainment vehicle for his kids.

• A licensed massage therapist seeks to use his Amiga 500 to maintain records, design forms, etc., in his business.

• A Wisconsin college student majoring in computer management purchases an Amiga for its sound and graphics.

• A Catholic priest from Long Beach, CA, who says he is "not in the least artistically gifted," is inspired instead by such applications as word processing, accounting and database management.

While this lineup may seem like the guest list for the next Donahue or Geraldo show, it represents profiles of some Amiga users. They're fellow *AmigaWorld* readers, people like you who are discovering new ways to utilize the Amiga and seek to maximize the use of their systems.

The Amiga community is a diverse group of users who have flocked to the Amiga market for various reasons. Some are long-time Commodore users who may have cut their teeth on the C-64 and for whom the Amiga represents a logical upgrade path. Some are first-time computer users. And some, although familiar with more sophisticated systems, are impressed by the price performance that the Amiga offers.

The strength of this market lies in the diversity of its users, each with his/her own perspectives, needs and expectations. In the Amiga community, you'll encounter the beginner; the hacker who lives to program in C or assembly source code and AREXX scripts; the speed junkie in search of the fastest accelerator board; the games fanatic; the professional video producer; the musician; and the general user.

History has shown us that the assimilation of heterogeneous groups such as this often produces invigoration and innovation. This is certainly true in the Amiga market. This melting pot of users ensures that the market doesn't become too myopic, but meets the needs of an amalgamation of interests and applications. Developers address the needs of both the power user and the beginner, the animator as well as the spreadsheet calculator. The result is a vibrant, multi-dimensional market.

Survey Results

AmigaWorld recently conducted a survey of its subscribers to find out more about them, their systems, applications and purchasing intentions. The results of our findings help us to fine-tune our editorial to meet the changing needs of our readers.

—The typical Amiga user is male, married, 37 years old, a college graduate, with an average household income of $58,950. He spends almost two hours with each issue of the magazine, which he considers the best source of information in evaluating Amiga hardware and software purchases.

—Half of *AW*'s readers own or use the A500; over 30% own the A2000; 20% are 1000 owners; and over 11% are 3000 owners. (The total represents over 100% due to more than one computer system owned.)

—*AW* readers have owned their Amigas for an average of four years.

—A typical system includes a joystick and modem and memory expansion (most are configured for 1-2 MB, while over a third have 5 MB or more). A hard drive is also part of most 2000 and 3000 systems, while a smaller percentage of 500 owners own a hard drive.

—Amiga users spend a significant amount on both hardware and software—the average is $3440 and $2000, respectively.

—Entertainment, word processing and animation are the three main areas of interest, followed by desktop publishing, video applications and telecommunications.

—Current Amiga users plan on spending an average of $1850 for hardware in the coming year. Those products most likely to be purchased include hard drives, accelerator boards and memory expansion, as well as CD-ROM drives and emulation boards.

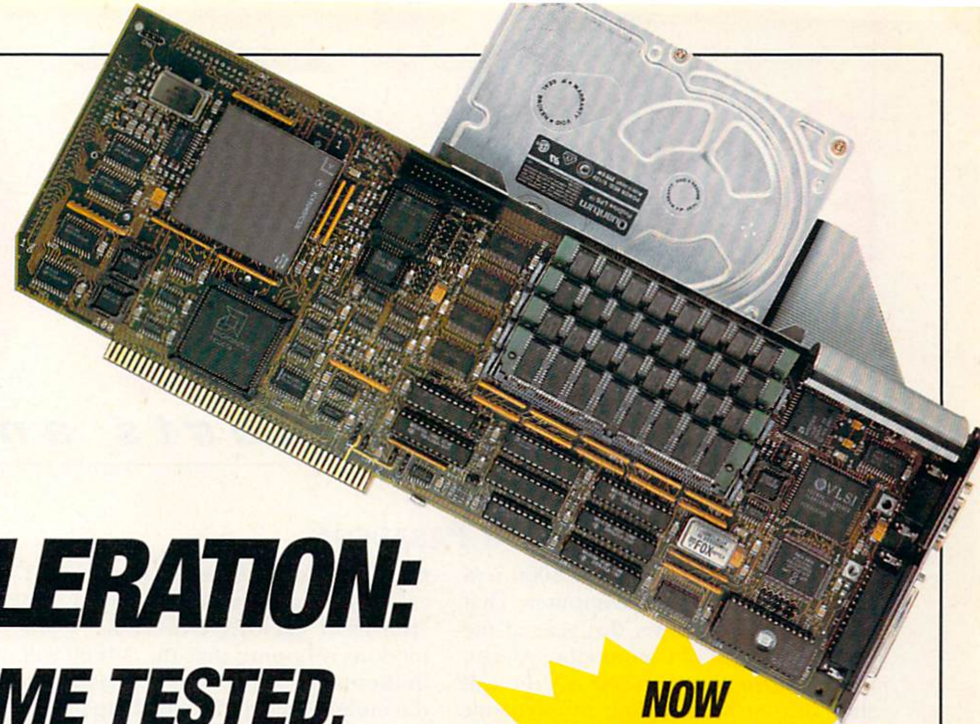
—Planned software expenditures in the coming year will amount to over $600, with games, animation, word processing, 3-D rendering, and music the major applications to be purchased.

This survey brings into focus a picture of the Amiga user and the market, which has it all. And *AmigaWorld*, as the name implies, covers it all.

Whether you're a media artist in search of the latest digital effect or a Basic programmer in search of the right routine, the common link you have with other users is your desire to get the most out of your computer system.And, as we close out the old year and look forward to an exciting 1993—a year that promises new applications, new machines from Commodore and new products for this market—*AmigaWorld* will be there to help you.

Dennis Brisson

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OVERSCAN

News, New Products and Networks

No "Little Old Lady" at Pasadena

Computer users now have 4000 reasons to own an Amiga computer. That was one of the themes this year at the Pasadena World of Commodore/Amiga, where ***Commodore*** kicked off the fall show season by unveiling the dynamic new **A4000**.

Large numbers of computer fans (some estimates placed them at nearly 20,000) packed the weekend show for a hands-on look at Commodore's powerful new machine, which, according to Commodore, represents the first generation of a new line of multimedia computers. With its new graphics, animation, and video features—including an advanced graphics chip set, a new operating system, and a new 68040 processor—the A4000 is designed to meet the graphics and video demands of multimedia computing.

The Word From West Chester

At a multimedia press conference, Commodore officials talked about the direction the company is taking. James Dionne, Commodore president and general manager, who noted that he has been involved in the release of all Commodore computers since the PET, called the introduction of the A4000 "the most exciting I've seen." Commodore is hoping that the A4000 will, in Dionne's words, "cement our share of the multimedia market and help us leap forward."

Another speaker was CBM's new VP of Engineering, Lewis Eggebrecht, whose keynote had a technical slant as he not only discussed the new graphic chips in the A4000, but also revealed some of the technology under devlopment in Commodore's R&D labs. The next-generation chip set (sometimes called AAA, or Triple A) is an extremly ambitious project that will take the Amiga well beyond today's state-of-the-art technology. Some of the features hinted at were true 24-bit displays, advanced audio, hardware image decompression, and multiple blitters. No timetable was given for products that will use this as-yet-unfinished chip set, but it was refreshing to hear Commodore publicly announce it was both planning for and working on the next generation Amiga.

Commodore took advantage of the occasion of this first-ever Pasadena show to reaffirm its commitment to the Amiga with increased levels of dealer, user, and advertising support. Commodore officials announced that selected software will be bundled with the A600 computers—including the A600HD version. Other new Commodore products showcased at Pasadena included a new version of **AmigaDOS (3.0)** and **AmigaVision Professional** (a significant upgrade over earlier versions), as well as the A570 CD-ROM drive for the A500.

The opportunity to win an A4000 attracted the attention of many show attendees, who, in 25 words or less, cited their reasons for using an Amiga and entered Commodore's "4000 Reasons to Own an Amiga" contest. The three best entries were to receive an A4000, an A600 computer with hard drive, and AmigaVision Professional, respectively.

On the last day of the show, Commodore also delighted attendees by presenting one of the very first A4000s to none other then Jay Miner. As the leading designer of the A1000 and one of the founders of Amiga, Inc., Jay is often ►

Faster, Faster

RCS Management wants to shift your A2000 or A3000 into high gear with its line of 68040 accelerators. Promising speeds of 18 to 20 MIPS, the **Fusion-Forty/LC** ($995 with no memory) is driven by an MC68EC040, has two-kilobyte instruction and data caches, lets you hardware select between 68000 and '040 mode, and supports up to 32MB of on-board RAM.

The **Fusion-Forty** ($1650) upgrades to a standard '040 chip with an FPU and MMU (rated at 18 to 20 MIPS and up to 3.5 MFLOPS), adds genlock capability, and beefs up each cache by two kilobytes. The **A3000 XLR8-2-33+** ($1500) lets you choose between the 68040 and 68030 via software, has four-kilobyte caches, uses the A3000's RAM, and promises to run at 20 to 22 MIPS and up to 4M FLOPS.

Boasting the same speed numbers as its A3000 sibling, the **XLR8-2-33+** ($2100, no RAM) hardware switches between the 68040 and 68000, supports up to 128MB of on-board RAM, and features a custom 64-bit wide interleaved DRAM controller.

Finally, the **XLR8-2-33+/LC** ($1800, no RAM) lowers cache sizes to two kilobytes and eliminates the FPU and MMU by using an MC68EC040 running at 20 to 22 MIPS. All boards support burst mode and include Fusion-BUS connectors for further expansion. (RS# 118.)

A New Way to C

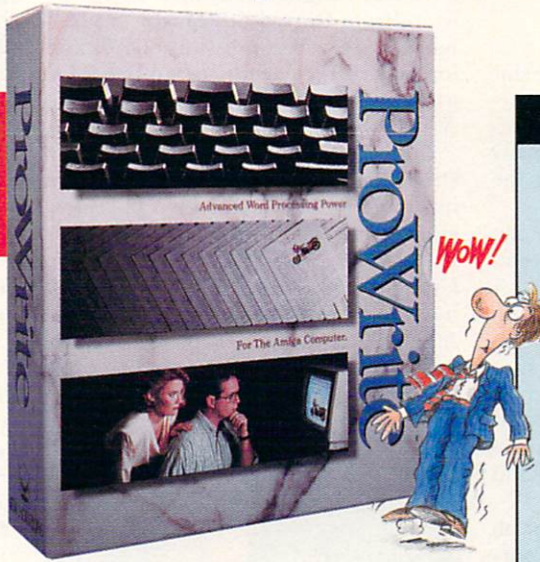
The long awaited update to ***SAS Institute***'s popular C compilier is now available to Amiga programmers. **Version 6 of the SAS/C Development System** ($395) adds global and peephole optimizers, a message browser, the CodeProbe debugger, and support for Amiga-to-Amiga cross development to its arsenal of options. Don't worry, there's more than 1000 pages of new documentation to explain it all, and technical support is now free. Adding more features, however, means more memory required. SAS/C will run in one megabyte of RAM, but some functions operate only when two or more megabytes are present.

To locate the vendors of products mentioned, see the "Manufacturers'/Distributors' Addresses" list on p. 117.

ProWrite® 3.3
The Best Just Keeps Getting Better

ProWrite is the best selling word processor for the Amiga®, and for good reason. High performance. Ease-of-use. Constant updates and enhancements. And now a new low price!

$99.95



New Features

ProWrite 3.3 gives you more power than ever before. More powerful graphic handling, including automatic text-wrap. Print preview. Password protection for your documents. The ability to name and find pictures in long documents. Full clipboard support, for seamless exchange of text and pictures with other programs. And **HotLinks ››**™ support, giving you total integration of ProWrite with other HotLinks-capable programs!

Proven Performance

Combine this with ProWrite's already formidable feature set, and you have the most powerful word processor for the Amiga. Features like multiple fonts and pictures. A spelling checker with over 100,000 dictionary words. A thesaurus with over 300,000 cross-references. Outline font support. Jaggie-free printing, for high-quality printing on dot-matrix printers. PostScript printing. Macros and AREXX support for power users. Mail merge, for form letters. And multiple columns, including side-by-side columns for writing audio/video scripts—a ProWrite exclusive! And the list goes on!

And of course, ProWrite 3.3 retains the speed and ease-of-use that has made it famous with thousands of Amiga users world-wide.

New Low Price!

Even with all this power, ProWrite is more affordable than ever before—because ProWrite is available now for only $99.95! So you no longer have a reason not to treat yourself to the best!

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Features

- "What you see is what you get" display.
- Multiple fonts, sizes, styles, and colors.
- Outline font support.
- Insert IFF and HAM pictures in your documents.
  - Automatically wrap text around pictures.
  - Multiple columns, with snaking or side-by-side text flow.
- Spelling checker with 100,000 word dictionary.
- Thesaurus with 300,000 cross-references.
- Full system clipboard support.
- HotLinksTM support.
- Undo and Redo command.
- Mail merge.
- AREXX port.
- Macros, when used with AREXX.
- Name and search for pictures in a document.
- Speaking capability, to read back document contents.
- Separate odd and even page headers and footers.
- Paragraph sorting.
- Automatic page numbering, with five different page number styles.
- Insert current date and time, with five different date formats and two time formats.
- Word count and readability level calculation.
- Up to 10 documents open at the same time.
- Document password protection.
- User-set document comments.
- Horizontal and/or vertical document rulers, for precise positioning.
- Custom page sizes.
- Print preview.
- PostScript printing, in black & white or color.
- High-quality graphics printing for jaggie-free output.
- Print NLQ text and graphics at the same time.
- Complete printer control, including sideways printing and 4,096 color printing.
- Automatic timed saves and backups.
- Import and export Professional Page text files.
- Comprehensive keyboard commands.
- Easy to use "3-D" user interface look.
- Fully customizable.
- Full support for Kickstart 2.0.
- Requires Kickstart 1.2 or later, one megabyte of memory, and two disk drives.

NEW HORIZONS

New Horizons Software, Inc. • 206 Wild Basin Road, Suite 109 • Austin, Texas 78746 • (512) 328-6650

Circle 65 on Reader Service card.

called the Father of the Amiga. Jay, who stated how impressed he was with the new machines, was extremely surprised and pleased with the gift.

AND FROM THE REST OF THE 'WORLD'...

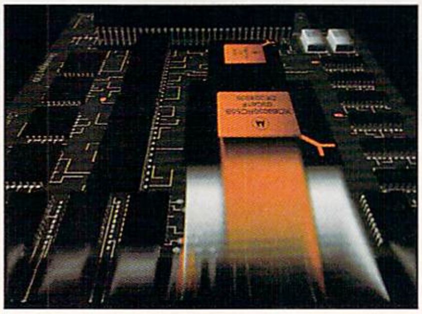
While the A4000 may have been the star of the show, the supporting cast was certainly noteworthy. The show provided attendees with a first-hand look at many exciting new products soon to hit the market.

SAS Institute released its new version **(6.0)** of the **C Development System**. *Scala* wowed attendees with the latest version of its multimedia-presentation software. *Black Belt Systems* demonstrated the many special-effects/image-manipulation capabilities, including morphing, of its hot new product, **Imagemaster**. *Migraph* presented a low-cost full-page scanner, as well as a hand scanner.

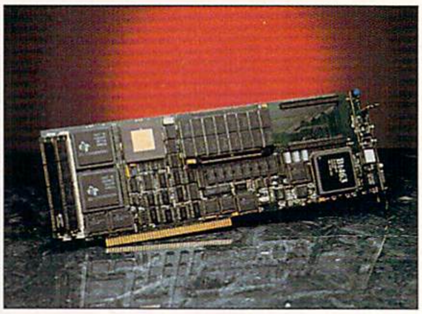
While attendees could get a deal on Amiga products at the *Creative Computers* booth, *Centaur* showed off the exciting graphics and video capabilities of its OpalVision board (see the review on p. 20 in this issue). The speedsters at *CSA* unleashed the latest in the company's line of accelerators: the **Derringer**, a low-cost, 25-MHz, 68030-based board, targeted for any Amiga needing A3000-level performance.

Euphonics displayed an interesting new product entitled **Lightworks Graphics Synthesizer**, which lets you create a visual and audio masterpiece on screen. *Digital Micronics* lifted the wraps from **Digital EditMaster**, its full-motion JPEG compression board, and introduced the exciting new **Vivid 24**, a graphics rendering board for the A3000.

Gold Disk held weekend-long demonstrations of its most recent software, including **Professional Page 3.0, Professional Draw 3.0, VideoDirector, Professional Calc**, and **Showmaker**. *Great Valley Products* featured a host of products, including its **A530 hard drive** for the A500, along with a new genlock board, appropriately called **G-Lock**. The company also surprised everyone with the release of **CineMorph**, a new image-morphing program.



CSA's latest accelerator, the 25-MHz 68030 Derringer.



Digital Micronics' new 24-bit graphics board, Vivid 24.

The **HiQTower**, which gives your A500 the power of an A2000, was on display at the *INOVAtronics* booth, as well as a new version **(2.0)** of the **CanDo** multimedia authoring system and graphics enhancers **(AVideo12 and AVideo24)** for combining Amiga graphics with 12- and 24-bit images. Viewers at the *ASDG* booth were treated to a tape showing the morphing and imaging capabilities of **MorphPlus**.

Axiom Software unveiled the newest features of **Pixel 3D Professional**. The special-effects wizards from *Pacific Digital* showed off that company's latest videographic programs, which combine visual and audio effects in surprising and sometimes strange ways. In addition to ►



ON-LINE SCAN

By Tim Walsh

Because this is AmigaWorld's annual Games issue, they asked me to cover the PD/shareware side of things in this month's column. My assignment was to come up with a list of the "Best Freely Distributable Games of 1992." Maybe they should have asked Andy Rooney.

You see, I'm not a big fan of Amiga computer games. The vast amount of time that kids spend honing their game-playing skills with various simulators could probably be better spent. Today's dismal job market shows little demand for individuals who can barrel-roll a Boeing 727 on final approach or exhibit perfect power-shifting techniques with race cars and motorcycles. (Hmm... maybe they *did* get Andy Rooney after all...)

I have to admit, though, that I'm guilty of playing games, too. Although I use spreadsheets a lot, and my joystick reflexes are probably a tad rusty, I still can't resist a little rousing arcade action from time to time. As long as it's done in moderation, game playing doesn't qualify as a serious character flaw. It's a good rule of thumb that if after a few days of "researching" or "testing" a new Amiga game, you find yourself suffering from sleep deprivation, then call it quits. Formulating strategies to outwit a laser-wielding knight or the sabre-touting dwarf lurking beneath the moat at the 23rd castle just isn't worth the loss of sleep, friends, or family.

"NET" GAINS WITH ON-LINE GAMES

Maybe my intense interest in games is the reason why I like the Amiga-specific ones found on the nets so much. They tend to differ quite a bit from their commercial counterparts. They are not necessarily better; rather, they just seem to be smaller, simpler, require little or no documentation, and can typically provide as much enjoyment as the most sophisticated simulators. Their sound and graphics often put some of the overpriced 16-bit game-machine cartridges to shame, too. Physical activity and socializing aside, nothing beats a hot game of Megaball on the Amiga after a long day at the office.

If you're after shoot-'em-ups, you're in luck, as the nets are literally riddled with them. Sure, there are plenty of complex, multilevel text-and-graphics adventures, a smattering of spelling and arithmetic gems, and some offerings worthy even of educational circles. However, shoot-'em-ups still rule the nets.

Best of all, the price can't be beat. That's important when you consider that surveys conducted in recent years reveal the majority of Amiga users are likely to spend more money on games than on productivity software. When you consider how inexpensive on-line offerings are, it becomes obvious the nets are a bargain when it comes to finding games. ►

demonstrating The Kitchen Sync and DCTV, ***Digital Creations*** showcased its new paint and animation program entitled **Brilliance**, which is compatible with the entire range of Amiga computers, including the A4000.

Soft-Logik Publishing demonstrated three new products: **Art Expression**, a new Amiga drawing program; a new version of the **PageStream** desktop-publishing system; and the **HotLinks** interactive data-exchange program. Also, the games still keep coming from ***Merit Software***, which released **Tom Landry Strategy Football** for Amiga fans who want to experience bone-crunching football action without the bumps and bruises.

Other show highlights included the following products and announcements:

- ***HyperMedia***'s new **CD-ROM of the Fred Fish library** of freely distributable software (which has now grown to well over 700 floppy disks);
- ***Ambitious Technologies***' **Toaster Oven** (with seven slots) for A3000 owners who want to convert their machines into a tower that will accommodate a Toaster;
- the latest version of **ProWrite (3.3)** from ***New Horizons***;
- new ***SunRize Industries***' audio products, including the **Studio 16** professional digital sound editor;
- ***Nucleus Electronics***' single-frame recorder for use with the Toaster, along with a preview of its new cuts-only editing system;
- a new product line (called **Trifecta**) of hard-drive controllers from ***ICD*** for the A500, A2000, and A2500 computers.

—Dennis Brisson and Lou Wallace

Which network is best for locating good Amiga games? That award probably belongs to GEnie, with Portal running a close second. Both networks offer the now massive Fred Fish collection of freely distributable games, so if you're looking for one of the games found on those disks, you can turn to either net for rapid retrieval. By comparison, CompuServe offers considerably fewer, while BIX runs a distant fourth place—with an emphasis on multiplayer, Amiga-compatible BBS games, where you play against opponents while on the phone lines.

The Best of '92

As I might have implied at the beginning of the column, simulators are my preference when it comes to Amiga games—so I'm out of luck because they're in short supply on the nets. Of course, if there's a shoot-'em-up arcade game that puts me in the cockpit of a fighter aircraft, that's a different story. But simulators of any kind are rare in the public domain, so my choices in the following list are not too heavily influenced by any personal bias to games of that genre.

That said, I've rounded up what I think are the top picks in public-domain games for 1992. Please note that virtually all of these are shareware games of varying, yet reasonable, cost. Do your part and support these folks so that we'll see more games in '93.

Mother Lode: For pure addicting fun, nothing beats the most recent incarnation of the popular standby, Lode Runner. With 50 levels and an optional level editor, digitized sound, and a full complement of play options, it's a well-rounded package.

Armed with a "microwave shovel", your goal is to gather all the chests on each level, while avoiding what appear to be rap-video extras complete with hooded sweatshirts. Although, technically, it has been available since very late 1991, it deserves inclusion with the best of 1992. As of this writing, its downloads number in the four-digit category on GEnie.

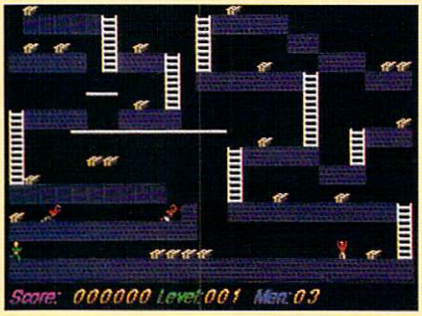
Umoria 5.4: There is no shortage of fans of the Moria series of games, and avid net junkies are undoubtably familiar with this particular offshoot by now. Stripped of some menus and graphic options, 5.4 is faster and more enjoyable to play than its predecessors. While its download numbers don't reflect much recent activity, Umoria 5.4 is one of the best text-and-graphics adventure games for the Amiga.

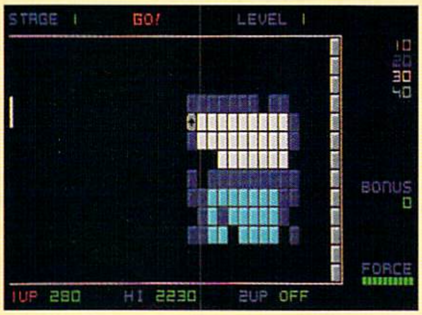
Minefield 1.15: Here's some software to round out your collection of games compatible with AmigaDOS 2.04 or higher. Variable board sizes and difficulty levels, score charts for each board, and selectable levels of play make this a winner. Of course, it's a must for all A3000 users.

Poing 1.0: I'm not just speaking for myself when I state few game players can resist a good Breakout-type game. Poing 1.0 is horizontal Breakout at its absolute best for the Amiga. Multilevel play helps keep the game interesting.

Intruder Alert: Fast-paced shoot 'em up action is still alive and well in 1992. An offshoot of the arcade game, Beserker, this one offers first-rate graphics and sound. Guaranteed to induce callouses on your firebutton finger or thumb.

Deluxe Pac Man: After all these years, Pac Man is still one of





One of the very best downloads of '92, Mother Lode (top), is the latest and greatest version of the classic Lode Runner. For fans of Breakout-style games, Poing is a super shareware substitute.

the best arcade games. Deluxe Pac Man is historically accurate to the original, retaining most of the critters found in the first version. Pay the shareware fee to gain access to all 20 levels.

Rocky: A rather exclusive program that isn't well-known, this program is an addicting, low-cost alternative to the popular Boulderdash.

Super Artillery: One of my all-time favorite types of games on the old Commodore 64 was the artillery game where the trajectory of the shells is based on numerous factors, such as wind conditions, topography, and so forth. Super Artillery does the same for the Amiga, except in a 90s' sort of fashion.

Downloading—literally for pocket change—a decent Amiga game that might provide years of entertainment makes for a pretty attractive investment. Although some of the larger games on the nets may use one percent or more of your 100-megabyte hard drive's storage capacity, it sure beats having to plop down between thirty and fifty bucks for a brand-new commercial program.

Special thanks to game guru Peter Olafson for his input in choosing the selections. To contact individual networks, use the following numbers:

BIX
800/227-2983
617/354-4137

CompuServe
800/848-8199
614/457-0802

GEnie
800/638-9636

Portal
408/973-9111 □

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▶ **Compose** easily using the DSS 4-track sequencer and your Amiga or MIDI keyboard. Draw from up to 31 instruments at a time, in up to four octaves with 8 different variable effects. Mix and modify sounds in real time as you compose, through direct interface with the sound editor.

DSS Stretches the outer limits of 8-bit sound

- Create your own 4-track, self-playing musical compositions.
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- Analyze graphic equalization of real-time sound.
- Remove "pops" from old phonograph recordings.
- Create custom instruments and sound effects by collecting and/or modifying pre-recorded instruments, voice, or sounds from any source, and use them in your own compositions.
- Save your sound and music to disk or send it out via modem for replay on any Amiga.

Check out these unparalleled features

✓ AmigaDOS 2.0 compatible; written in assembly language.

✓ Multi-tasking operation.

✓ 68020 and 68030 compatible.

✓ Comprehensive tutorial manual helps even beginners get started right away.

✓ Intuition-based graphic interface makes operation easy.

✓ MIDI-in capability.

✓ Direct interface between sequencer and editor.

✓ Hold 31 sound samples in memory at once – all shown on screen so they are easy to manipulate.

✓ Effects and processing capabilities include echo, mix, filter, re-sample, sound data inversion, playing sounds backwards, loops, fade-in/fade-out and more.

✓ Manipulate sound samples in real time, as you listen.

✓ Create sampled instruments with 1, 3 and 5 octaves.

✓ HIFI recording for highest quality playback.

✓ Controls for faster/slower playback and filtering high frequencies during playback.

✓ Load and save samples, songs and instruments in multiple formats.



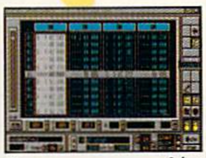


✓ Multiple effects for each note.

✓ Stereo and monophonic operation. Also convert mono to stereo or separate stereo.

✓ Auto-playing music modules.





✓ Real-time oscilloscope and spectrum analysis.

✓ Real-time reverberation.

✓ Graphic editing of wave forms through easy-to-use functions, including zoom in/out and precision controls for position, frequency and amplitude.

✓ Draw sound waves freehand using the mouse.

✓ Direct editing of individual sample numeric values.

✓ Maximum recording speed of 51,000 samples/second (38,908 samples/second in stereo).

✓ Savable Preference settings.

✓ Saves in IFF, SONIX or RAW formats.

✓ Compatible with SoundTracker, NoiseTracker and SoundFX modules.

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It's Learning That Matters

Events at SIGGRAPH '92 provided an opportunity for the Amiga not only to flex its already well-developed artistic muscles, but also to demonstrate that it really can hold its own in the classroom. Hollywood producer Coco Conn invited Chicag-area teachers to choose 30 students between the ages of 11 and 17 to take part in a multiplatform creative workshop dubbed SIGKids. Eleven of the group landed in the Amiga Art Corner with Amiga artist and art education producer Curt Kass.

The Amiga group's original assignment was to animate a logo for Nickelodeon's Nick News W/5. When the program's producers had a change of heart, Kass and his crew landed a new assignment and a more challenging project—to describe through video what is wrong with America today and offer a solution. Portions of the project will air on PBS's November Learning Matters as an election-month piece, in a segment devoted entirely to computers and technology in the classroom.

According to PBS staffer Karina O'Riordan, SIGKids caught the attention of the producers of Learning Matters because the students were learning independently with few guidelines. SIGKids fits well into Learning Matters' coverage of computers in education inside and outside the classroom.

Kass stated that the success of the Amiga SIGKids project was directly connected to the opportunity to create a curriculum. The kids were not just thrown into a room with computers and asked to emerge six days later with a finished video. The students conceptualized and designed the video themselves, but were informed in advance what was expected of them and were provided with the tools and knowledge to succeed.

While the Amiga group was originally scheduled to develop individual videos, the students voted for a collaborative effort. Each of them contributed according to his or her own abilities and interests. The video includes original digitized stills, animations, and sampled sounds.

With the help of Commodore's Rick Block, Steve Johnson, and Ken Nordine, Kass showed students how to storyboard, use source material, and utilize video-production procedures. Although only two of the eleven Amiga SIGKids had previous experience with Amigas, within three days they became proficient with a variety of products, including DeluxePaint (Electronic Arts), The Art Department (ASDG), DCTV (Digital Creations), Final Copy (Softwood), and SuperGen (Digital Creations).

The Chicago-area Amiga Art Corner participants were Robert Casey, Helen Choi, Nathan Fredrickson, Michele Gonzales, James Kelly, John Kubo, Chris Montoya, Adam Mathes, Corey Murray, and Hui Young Pak. The original team also invited a visiting student from South Africa, Mael Gerard, to bring his artistic talents to the project. Tune to your local PBS station during November for a first-hand look at what a good program can do with talented young people and your favorite computer. *—Jan Jackson*

Are They Being Served?

Spending too much time in the back room buried in ordering, invoicing, pricing, and inventory paperwork—and too little time on the store floor with your customers? Pile the work on **The OrderDesk** *(Gramma Software)*. The modular system is divided into Order, Customer, Inventory, and Tickle windows. The Order Window produces invoices complete with user-definable shipping charges and taxes, resets pricing, calculates accounts payable and receivable, prints sales reports, and supports cash, check, COD, on-account, and several credit card sales.

The Customer window stores 25-line records of customer data, lets you search on any field, and prints customer-activity reports and labels. The Inventory Window automatically reduces or increases its contents based on customer activity, accepts data from ARexx-compatible programs, and prints reports. Accessible from a gadget in the Customer Window, the Tickle Window saves and recalls notes and reminders on customers and orders.

The program is available in three configurations: **The OrderDesk** ($200), which supports up to 300 products or customers; **The OrderDeskU** ($225), which handles unlimited numbers of the same; and **The OrderDeskUI** ($250), which adds an inventory module to unlimited product and customer support. (RS# 110.)

Video Wallpaper

Designed for video and multimedia productions, **Beyond Backgrounds—Pro Set** is a ten-disk collection of 24-bit, severe-overscan backdrops. The images are in IFF24 format and depict such subjects as clouds, celebrations, weddings, cartoons, trophies, coffee cups, grids, the stage, and people. The compilation includes 14 texture-map images for 3-D objects. Available from ***Frostbyte Systems***, Beyond Backgrounds retails for $99.95. (RS# 119.)



Overheard

Women in the audio, video, broadcast, and related industries have a place to turn when they feel isolated in their professions. The Technet network provides a forum for exchanging technical information, finding job leads and professional organizations, and more through its many conferences. The network seeks to strenghten and advance the careers of its members, increase the profile of women in the industries it serves, and recognize companies that promote women.

If you support the group's mission, get involved! Whether you're a man or woman, the volunteer organization wants your ideas and participation. To receive the group's first mailing, send a SASE to Julie Perez, 110 Horatio St. #617, New York, NY 10014. You can also get more information by calling 212/727-8352 or 707/485-5373.

Lamp Included?

Aladdin 4D (***Adspec Programming***, $499) improves extensively on its predecessor, Draw4D-Pro. New features include a timeline system that allows polygon attributes to change during an animation; procedural textures and the ability to map textures as opacity, bump, reflectivity, normal, genlock, or decal; wave sources that can be assigned to a path and moved in 3-D space; gases with controllable color and density; ray-traced shadows; facet, Gouraud, or Phong shading; and the ability to render to Firecracker 24 (Impulse), Resolver (Digital Micronics), and DCTV (Digital Creations).

A new camera system replaces Draw-4D-Pro's eyepath approach. The Aladdin 4D camera can have an unlimited number of target points and will cut from one target to another or pan between them during an animation. The program employs a single-window editor and lets you preview animations. To squeeze out extra rendering speed, a math-coprocessor version is included with the package. (RS# 123.)

Overscan is compiled by Barbara Gefvert, Linda Laflamme, and Tim Walsh. Send your news, new products, and network information to Overscan, *AmigaWorld* Editorial, 80 Elm St., Peterborough, NH 03458. ■

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★ Make your own add-on features with full ARexx™ and C programming language support.

★ Enjoy near "real time" painting in 24-bit color.

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If you need ImageFX™ morphing power alone, CineMorph is for you.

CineMorph transforms any image, or images, from one to another quickly, easily and with the professional quality "morph" results you see at the movies and on TV.

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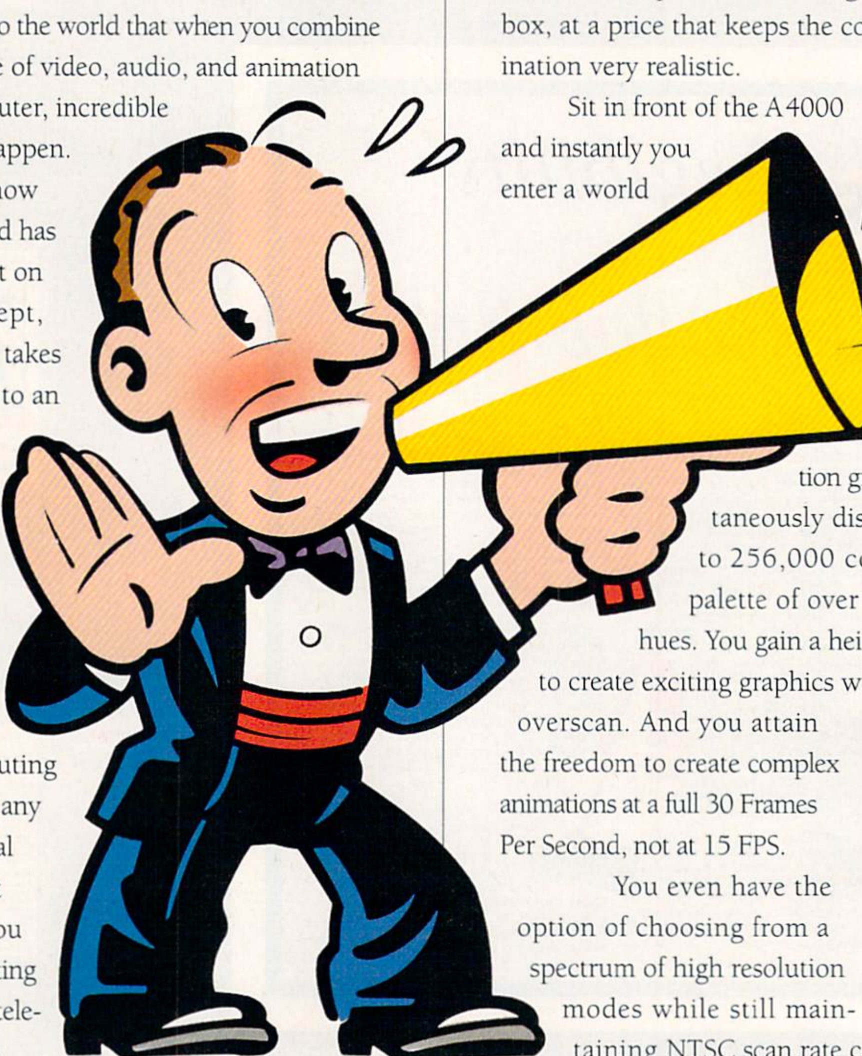
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That's because the Amiga is the only computer designed as a multimedia machine from the ground up. Which means the A4000 doesn't suffer the handicaps other so-called multimedia machines endure. There is no need for costly, cumbersome add-ons, no need to kludge together potentially incompatible components. So it gives you spectacular multimedia performance right out of the box, at a price that keeps the cost of imagination very realistic.

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All this multimedia muscle, of course, comes through true design elegance. At the heart of every A4000 lies our new, unique, custom coprocessors, the Advanced

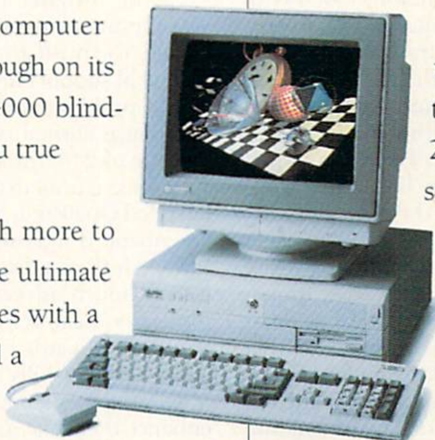


The Amiga 4000 gives you the ability to easily create real-time, colorful animations.



Announcing The Amiga® 4000. The Encore To The Most Powerful, Cost Effective Multimedia Computers Ever.

Graphics Architecture™ chip set, and the latest multitasking operating system, Amiga DOS™ 3.0. Add to this Motorola's thundering 68040 Chip (which other computer companies consider to be enough on its own), and not only is the A4000 blindingly quick, it literally gives you true workstation power.



Of course, there's much more to the A4000 than just being the ultimate tool for creativity. It also comes with a large capacity hard drive, and a 1.76 MB dual speed high density floppy drive which, combined with Cross-DOS, allows you to read and write MS-DOS® files. And a design that allows for



expandability, compatibility, and the capability for hundreds of business applications.



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Circle 9 on Reader Service card.

OpalVision

24-bit display, painting, and presentation.

***Centaur Software*, $995.**
A2000, A3000T, A4000.
Internal, video-slot connection.
Installation: easy.
Hard drive-installable software.
Not copy protected.
2.0 compatible.
Accelerator compatible.
Minimum system: 1MB chip RAM, 2MB fast RAM, hard drive.
Recommended system: 2MB chip RAM, 4+MB fast RAM, hard drive, accelerator board.

These days, when a company advertises a new "video board," it could be anything from an enhanced-color display card, a video-capture card, or a video-overlay card, to a card that combines all of these capabilities.

Solid Foundation

With OpalVision, the ambiguity is part of the plan. The main board of the OpalVision system displays a screen of up to 768×476 pixels on a standard 1084-style interlaced monitor (768×576 on a PAL monitor), using any of over 16 million colors. With planned optional modules (unreleased at this writing), you will be able to add a framegrabber and overlay genlock, a deinterlacer that allows the use of 31-KHz VGA-style monitors, and a module that provides a four-input switcher with digital video effects, *a là* NewTek's Video Toaster. This modular design means that you add (and pay for) only the options you really need, as you need them.

Even without its optional add-ons, the OpalVision main board is an appealing choice for adding "true-color" capability to an Amiga. As with other framebuffer boards, the 16-million-color display is separate from the Amiga system display. This means that although you can load and display standard 24-bit IFF graphics files, you cannot run the Workbench or other Amiga software in 24-bit color. OpalVision can, however, combine a normal Amiga display with its own display on the same monitor. This allows you to overlay Amiga graphics on a true-color background or to make them peek through "holes" in the 24-bit picture. With the optional framegrabber/genlock module, you can add a video layer as well.

The only problem I experienced with hardware installation was on an A3000T, whose video-slot opening is a little cramped. An adjusting screw on the mounting bracket was so close to the 23-pin monitor connector that it was difficult to insert even the smallest jeweler's screwdriver when the large molded plug from my 1084 monitor was connected. (I had to angle the plug in to make the adjustment.)

I found that software installation was very easy on most of the systems I tried, because Commodore's standard installer program is included with the package. On one 1.3-based system, however, the installer program consistently crashed when trying to install the sample images, and I was forced to finish the process manually. Centaur technical support informed me that they are aware of this problem and are working to correct it.

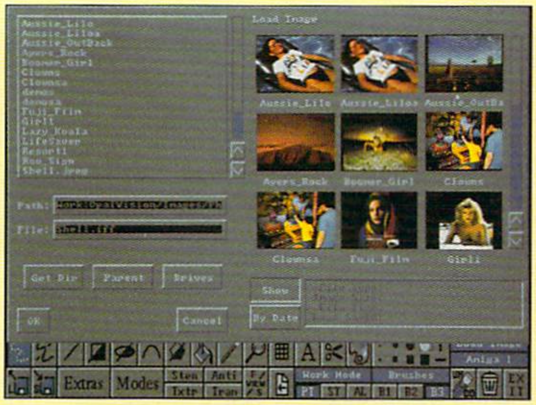
Because normal system software cannot take advantage of 24-bit framebuffers, specialized software support is crucial to a product like this. Centaur has included OpalPaint, a paint program; Opal Presents!, an enhanced slide-show with transitions; and OpalVision HotKey, a display control program. Although it's not much advertised, a Workbench 2.0 driver for the popular Wacom drawing tablet also accompanies the board. Finally, there is King of Karate, which Centaur bills as the "world's first 24-bit personal computer game." The colorful backgrounds do enhance the game somewhat, but it's safe to say that nobody will buy OpalVision just for this game.

Powerful Paint

Of the included software, OpalPaint is by far the most significant. One of the most ambitious 24-bit paint programs currently available for the Amiga, it attempts to combine the best features from high-end paint programs on the Mac and PC with familiar tools from such Amiga standards as DeluxePaint IV (Electronic Arts). It is the first Amiga program I've seen that has both selectable brush characteristics (airbrush, chalk, watercolor, pencil, and so on)

To locate the vendors of the products reviewed, see the "Manufacturers'/Distributors' Addresses" list on p. 117.

W S



The file requester's thumbnails take the guesswork out of loading images.



OpalPaint's palette mixer lets you stir colors together like a traditional artist.

and paper types (rice paper, rough paper, and more), which lets you emulate conventional artistic styles and media on the computer. The program features a number of interesting new drawing modes, and, as with the brush and paper types, you can load additional drawing modes from disk, which greatly facilitates program updates.

OpalPaint's stencil feature allows you to specify the area to protect by drawing the stencil shape, by selecting a color or range of colors to protect, or both. Stencil colors, fill colors, and brush background colors can all be selected using tolerances that let you choose not only the exact color, but also any color that is close. You indicate what is considered close by setting the range of hue, saturation, and value levels individually. This makes it possible to fill a digitized picture of a person's face, for example, even though the skin tones vary slightly from point to point. You can also specify transparency levels using this same system of tolerances, allowing you, for instance, to change only the hue of the current image.

The more traditional features of the program are well implemented. Although the tool bar shows only 20 paint pots at a time, there are 13 such rows in any given palette, which you can flip through rapidly. The palette mixer includes RGB and HSV sliders, a color wheel, and a mixing area where you can stir together colors to form new shades.

You can save and load files in IFF or JPEG format, and there is a proprietary mode that loads large images more quickly. To let you preview saved images, OpalPaint creates "thumbnails," small representations of the files' pictures that appear in the file requester. Many of the geometric tool icons (line, box, circle, arc, and so on) work exactly like their DeluxePaint counterparts, down to the keyboard equivalents and the settings you can vary with a right-mouse-button click.

Although working with 24-bit images is generally slow, OpalPaint performs fairly well, as long as you work on an accelerated machine. Its treatment of custom brushes is a good compromise between moving the full 24-bit image (which can be excruciatingly slow) and showing a rectangular outline only (which makes it hard to position the brush). OpalPaint shows an outline that is similar to a two-color representation of the brush. You can move this quickly, but still see the image outline to help with placement. The program also features a "rip-and-redo" feature that lets you undo a brush stamp, move it over a pixel, and stamp it down again, all in one operation.

OpalPaint may be powerful, but it isn't polished. Not yet included are some of the planned features: ARexx support, the alpha channel (which provides variable transparent overlays), and the magic wand (which uses edge detection to fill an enclosed area that contains a lot of different colors).

Other included features don't work quite right. For example, if you hold the Shift key while resizing a brush, the operation is supposed to maintain the picture's original aspect ratio, but what it really does is constrain you to straight horizontal or vertical movements. The program occasionally crashed or did such strange things as fail to re-open the Workbench screen on exit, forcing a reboot. While these bugs don't render the program unusable, I hope to see them corrected in the next update.

Show Offs

The other two programs, Opal Presents! and Opal HotKey are a step up from the usual display programs that accompany a graphics board. A slide show program, Presents! provides 20 transition patterns for changing from one picture to the next. Its push-button interface is very easy to use. All you have to do to create a presentation is select your pictures from the file requester, set the transition pattern, transition speed, and frame-advance method. You can advance frames by clicking the mouse button, setting a timer, or sending a command through an ARexx port. The program also lets you choose whether you want to show the OpalVision display, the Amiga display, live video, or a combination of the three. In addition, you can attach a CLI command to each slide for starting a music or animation player. ►

HotKey allows you to use function-key combinations to load 24-bit images into the framebuffer and select the various display sources (Opal, Amiga, and video). HotKey also has an ARexx port, which allows other presentation programs to combine OpalVision graphics with their Amiga slide shows.

While Presents! and HotKey theoretically seem well suited to multimedia presentations, they have some practical problems. The OpalVision board appears to use the top line of the display for some control signals, which sometimes show up as small red dots at the top of a screen that combines Opal and Amiga graphics. In most cases, you can adjust the display to keep them from showing. Also, the Opal software may push down the regular screen display to separate it from the control line, which tends to make vertical centering a problem. Finally, JPEG and large IFF files load fairly slowly, and the loading process may disrupt the show.

Show Me More

Despite some minor problems, the OpalVision main board makes a very favorable first impression. The display is near photographic, as advertised, and the bundled software is better than the run-of-the-mill applications that usually come with graphics boards. The only missing variable in the equation is how quickly Centaur will follow through with its intended hardware and software additions. If, as promised, the genlock/framegrabber module, the switcher/effects module, and the deinterlacer module are available by the time you read this, it will be a very good sign.

With some software updates, third-party programming support, and support for all of the hardware features (such as double-buffered animation and 8- and 15-bit display modes), OpalVision could become a real force in the Amiga graphics market. As things stand, it's a very promising newcomer.

—Sheldon Leemon

AMOS the Creator (American Amos)

Europress Software, $110.

Hard-drive installable.
Not copy protected.
2.0 compatible.
Accelerator compatible.
Minimum system: 512K RAM single floppy.
Recommended system: 1MB RAM, hard drive.

Programming graphics- and sound-intensive applications.

Easy AMOS

Europress Software, about $50.

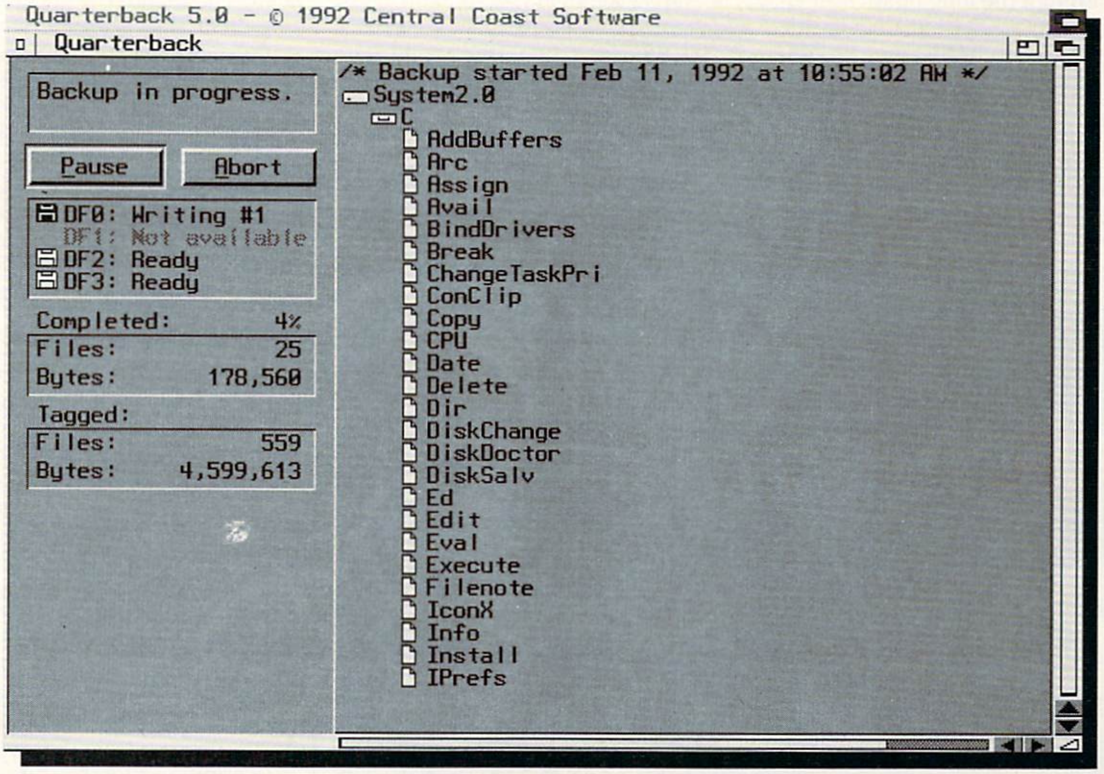
Hard-drive installable.
Not copy protected.
2.0 compatible.
Accelerator compatible.
Minimum system: 1MB RAM single floppy.
Recommended system: 1MB RAM, hard drive.

Learning programming techniques and constructing games.

Have you ever gotten halfway through a game and thought "This would be so cool if only...?" Well, you're certainly in excellent company. Lots of Amiga users have great ideas for games but lack the time or temperament to wrestle a powerful programming language into submission. They just want to get right to the magic. Well, to all of you who are discontented with the current state of the art in games (or programming languages), ►

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- *Full macro and AREXX support*
- *Full Workbench 2.0 compatibility*
- *Improved user interface, with Workbench 2.0 style "3-D" appearance*
- *Many more features!*

Thousands of people rely on Quarterback for their backup and archival needs. Now, with Quarterback 5.0, there is even more reason to do so. Greater speed, even more features, and proven reliability. And a new "3-D" user interface puts these powerful capabilities at your finger tips. With features like these, it is no wonder that Quarterback is the best selling backup program for the Amiga. Would you trust your data with anything less?

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AMOS is here to unchain your creativity.

The AMOS authors got my attention right from the start with the inflammatory assertion that "computer programming is dead easy." This audacious statement could enrage anyone who's sweated through the long hours needed to conquer a powerful but user-hostile language. After all, BASIC may be considered "dead easy," but everyone knows you can't make a fast-moving game in BASIC. To get power, you have to trade off ease of use and move up to something elaborate and complicated, right?

Wrong. AMOS delivers rapid motion, lush sound, and structured control in one streamlined BASIC-like language package. Europress promises speed *and* ease of use, and it actually delivers.

Old Friends and New Faces

The AMOS command set contains all the old favorites of BASIC, like IF, THEN, ELSE, PRINT, arrays, and string handling. In addition, it adds some very important new commands for easy definition of Blitter objects (BOBs) and hardware sprites, screen drawing, animation, sound, menu-building, and disk access. You can even send data through the serial port for two-player games. Commands such as INC and DEC greatly improve calculating speeds with fast integer math, while you can create procedures to help you structure your programming and pass variables back and forth. The sound commands can generate synthetic sounds or play samples or music from popular Amiga music programs.

To most game programmers, crisp screen scrolling and fast, flicker-free sprite movement is vital. Usually this calls for tricky screen synchronization and double buffering. AMOS handles all the details for you with such simple commands as DOUBLE BUFFER, and that alone is worth the price of admission. This language also provides unambiguous access to all screen modes, including hi-res interlace, HAM, and Extra-Halfbrite, and the DUAL PLAYFIELD command handles the intricacies of parallax scrolling.

All this power is augmented by AMAL, an extraordinary animation-language subset optimized for smooth motion at blistering speeds. It's trickier to master than standard BASIC, but it's nowhere near as complex and mind-numbingly alien as real assembly-language programming. (Apologies to programmers who think in machine-language registers.) Each AMAL program can define the motion and behavior of a single sprite or the entire screen, and you can run up to 16 AMAL programs simultaneously.

In addition to its uncomplicated features, AMOS is full of thoughtful touches and virtuoso flourishes. For example, rather than type in every screen location to define sprite motion, you can record the motion while you draw it on the screen with the mouse. Instead of figuring out complex palette tricks for special effects, you invoke the FADE, FLASH, ZOOM, and RAINBOW commands.

For power users who want even more, AMOS can link to C or access directly the Amiga hardware through machine code. All this is neatly wrapped up in a package that allows you to build run-time modules that may legally be sold or placed in the public domain. Such power cries out for a compiler to make your programs into faster, tighter code. Unlike American AMOS, however, AMOS The Compiler and the AMOS 3-D module are not available in NTSC versions at this writing. While you can order the PAL versions from Europress, be warned that they have problems running on American NTSC systems.

Quirky Work Space

The AMOS programming environment consists of five editors—program, sprite, map, menu, and AMAL—and a sprite ►

grabber. The powerful AMOS editor has some fine features, such as a help line, debug assistance, and an immediate mode for trying out commands. Unfortunately, it's encumbered by a weak interface; the screen does not make effective use of space. It looks cute at the expense of copious blank space. Nor is there a provision for interlaced displays, which means you're stuck with a mere 18 lines of code visible on the screen at once.

This cutesiness is an unfortunate side-effect of the program's Atari ST roots, as are the lousy file requesters. These problems are far from fatal, but one nonstandard feature could significantly hamper some AMOS applications. AMOS does not work properly through Intuition, and its applications do not show up on lists of currently running processes. Consequently, AMOS does not flip screens correctly. Clicking the back gadget or typing Right-Amiga-M does not push the screen to the back. Fortunately, Right-Amiga-A accomplishes the same result. This is an annoying inconsistency that could frustrate programmers who are trying to use AMOS to make productivity software that follows Commodore's rules.

The manual is functional and constitutes a great technical reference, but, like so many other programming-language books, it skimps on tutorials and how-to information. Plus, the notes to absolute beginners are hidden at the end. Luckily, total beginners have a better option. They can get started with the new language, Easy AMOS.

Hand Holder

Easy AMOS is a stripped-down subset of the AMOS commands in a more user-friendly environment. It lacks such power features as AMAL and such speed commands as INC and DEC, but it gives you easy access to graphics, sound, data handling, and memory management. You can even get to the machine-language level. The editor sports a beefy Help system, debugging tools, quizzes, and lots of sample programs. The Tutor allows you to watch a program as it executes step by step—a great help in learning and debugging.

The heart of Easy AMOS is the manual. It's light, breezy, and very informative—a joy to read and use. The well-written factual material is leavened with lots of cartoons, oddly appropriate quotes, and even flip-book animations in the corners. All this adds up to a successful learning tool. A lot of companies would be well served by a look at this book. Despite its charming manner, Easy AMOS is still a muscular language, and the best introduction to programming I've seen.

Although AMOS and Easy AMOS shine best when making games, they can make serious productivity software, as well. If Europress could clean up the weird requesters and nonstandard manner of flipping screens in its next release, AMOS would be a flawless programming environment. So go ahead. Make some magic.

—Daniel Greenberg

The Personal SFC

***Nucleus Electronics*, $425.**

Hard-drive installable.
Not copy protected.
2.0 compatible.
Accelerator compatible.
Minimum system: 1MB RAM
Recommended system: 3MB RAM, hard drive.

Single-frame recording of animations to videotape.

One of the inherent frustrations in doing computer-based animation is getting a smooth playback of the anima-

Continued on p. 78.



IN OTHER WORDS, PEOPLE MUCH LIKE YOURSELF.

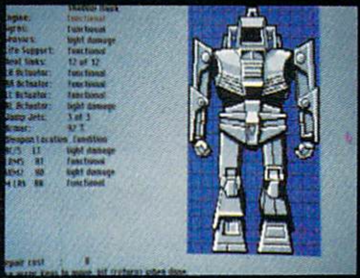
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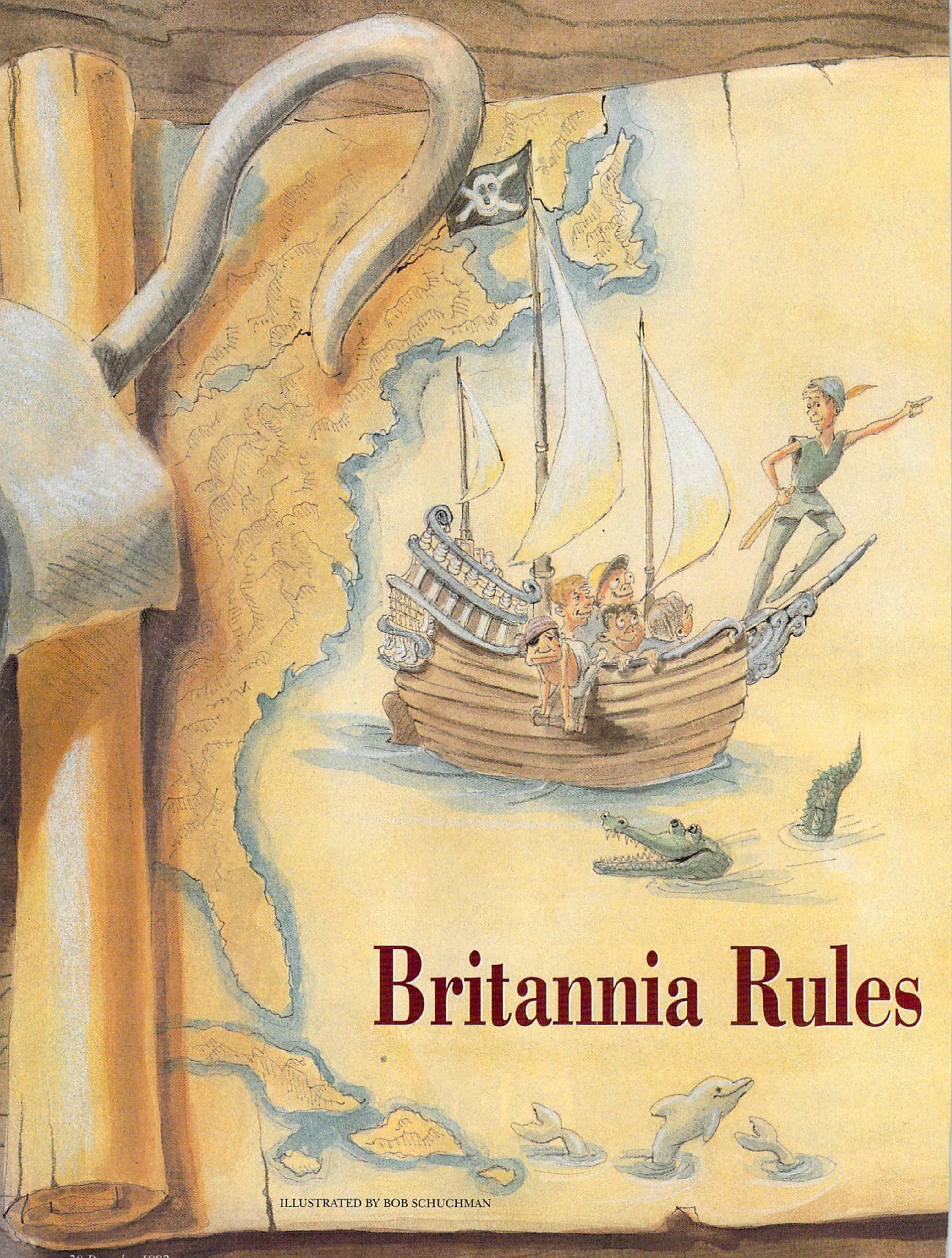
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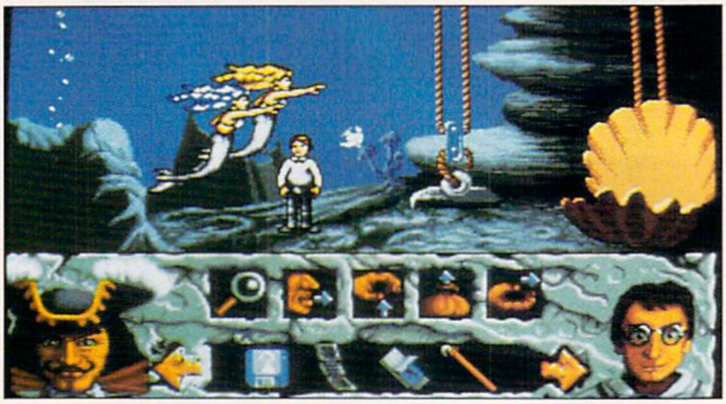
BY PETER OLAFSON

I know a place where the Amiga gamer's dreams are born. It's a lot closer than "second to the right and then straight on till morning"—actually, only about 3000 miles from New York. And, oddly enough, this island is exactly the place from which Peter, Wendy, John, and Michael flew to begin their own adventures.

England is the Never Never Land of Amiga gaming. And they *never* (well, almost never) talk about port-overs from the PC. In fact, when a computer game comes out there, the Amiga version is almost always first and—if you could imagine such a thing—sometimes they even say, "Oh yes, and we *are planning* an IBM version later!" Big Blue, you see, is only the third machine down the ladder (after the declining Atari ST).

The "Amy" is queen in Britannia, and she accordingly rules the seemingly endless wave of game development. She is invariably the centerpiece of entertainment-software exhibitions. In computer shops, the walls and shelves are covered with the newest titles. Publishing houses like Electronic Arts, MicroProse, Virgin, and Activision have entire divisions here to cater to the appetites of an Amiga game-buying public. The machine is the focus of a highly competitive and opinionated press corps that treats Amiga designers and programmers such as Andrew Braybrook (Rainbow Islands, Fire & Ice) or Mike Singleton (Space Cutter, Midwinter, Flames of Freedom) much like artists or movie directors.

Don't pinch yourself. Do not adjust your magazine.



Inspired by the movie, Ocean's Hook is due for US release soon.



Electronic Arts' Risky Woods: Arcade adventure at its best.

(The cover hasn't suddenly changed to *Bizarro AmigaWorld*.) It may sound as though you've entered some alternate universe in which things work out the way they're supposed to. But this topsy-turvy vision is not a dream; it just feels like one—the kind you wake from grinning like a maniac.

Europe generally—and England in particular, as the focus of this article—can be sheer heaven for American Amiga gamers swimming in a Big Blue sea inhabited by fat-chance-ports like Ultima Underworlds and Falcon 3.0. But you don't need a passport or airfare for this European vacation. Your out-of-the-box Amiga, with the help of a utility or two (and a credit card), should be just the ticket.

Many US Amiga gamers know of Europe only through the work of companies like England's Psygnosis (which has supported the Amiga virtually from the get-go and whose games are still widely regarded as cutting-edge). That's understandable, as it is one of only a few European labels—Electronic Zoo, Titus, Silmarils, and UBI Soft are others—to release games only under its own imprint in America. (Electronic Zoo has dropped out of sight here—a shame, as it has been the source of many an interesting and odd game.)

Many others have opted to license the American release of their games to domestic publishers—hence Konami's new line of Konami/Gremlin titles, Cinemaware's entire Spotlight line, and Data East's release of Infogrames's Drakkhen, Kult (as Chamber of the Sci-Mutant Priestess), and Continuum.

Yet, you don't necessarily have to wait for an American distributor to pick up some of these British gems in order to start playing. Later on in this article, we'll look at some sources you can use to help you get your hands on many of these titles right away. But for now, let's get to the games themselves.

New Games Galore!

So many games to mention...so little space. There's a positive embarrassment of unsampled riches from across The Pond. *(Note: Information about contacting the developers of these European games directly is contained in the accompanying "Eurogames Resource Guide" box.)*

Let's start out with some unfamiliar titles from familiar publishers. Ever heard of ***MicroProse***'s **Special Forces**? No, I thought not: It's a prime, for-the-Amiga revision of the company's old Airborne Ranger game. ***Electronic Arts***'s **Risky Woods**? Nope? Well, it's as console-able an arcade adventure as you're likely to find outside the cart slot of a Super NES. **Floor 13**? That's a cryptic, black-and-white strategy/adventure game from ***Virgin*** that places you at the head of a CIA-like outfit. **Rookies**? No, it's not a hopelessly-dated license from US television, but ***Virgin***'s sweet-looking isometric wargame. **Shadowlands**? That's ***Domark***'s giant isometric RPG. **Alcatraz**? That's ***Infogrames***'s follow-up to 1987's Hostage. **Ashes of Empire**? That's the new one from Mike Singleton. **Epic**? That's ***Ocean***'s long-awaited 3-D space-combat game.

If you're a puzzle-game fan, there's ***Ocean***'s charming **Pushover**, ***Storm***'s **Spherical Troddlers**, and ***Coktel Visions***' **Gobliiins**. **Ishar—Legend of the Fortess**? That's ***Silmarils***' big-windowed addition to the canon of Bard's Tale-ish RPGs. **Zool**? That's ***Gremlin***'s hot new arcade game—one that some observers suggest could provide a character as identified with the Amiga as Sonic the

ACROSS-THE-POND PICKS

HERE'S AN ASSORTMENT of European imports— recent, middle-aged, and positively decrepit—that just may play on an Amiga in Peoria. Consider this compilation a broad sampling of recommended titles—not an "All-Time Best" list—from which to pick, choose, or reject as you see fit.

Deliverance
(21st Century Entertainment)
No, it's not a movie license. (Don't give them any ideas, eh?) You've played Gods, right? It's a great game, innit? Well, this is like Gods, but with everything bigger—including the challenge—and not quite as heavy on the chrome.

Voodoo Nightmare (Palace)
One of my favorites; a vast, pretty (and pretty dumb), hugely entertaining isometric romp.

Project X (Team 17)
The outfit that produced Alien Breed, the outstanding overhead-perspective, multidirectional shooter, turns its attention to the horizontal shoot-em-up. Yeah, it's a tired old genre, but they do it better than just about anyone. There's stuff in here you won't see outside of an arcade. (Hell of a fight to get there, though.)

Premiere (Core Design)
Core successfully adapts the mildly goofy, large-character animation from its arcade-RPG Heimdall to a platform format.

Abandoned Places
(Electronic Zoo)
It looked for a while as though this giant RPG out of Hungary (!) might surface here via the good graces of TTR Development, but TTR sadly seems to have gone the way of Electronic Zoo. It's not a classic, and it has some playability flaws, but overall it stands up as a nice mix of genres—from Dungeon Master WYSIWYG to Ultima. Warning: The five disks do not love a hard drive and seem iffy even about recognizing a second floppy.

Warhead (The Movie House)
OK, Mantis for the Amiga has been canned, but you can still play the game that it was to be built around. That's Warhead—a nice mix of filled-polygon and bitmapped graphics that flow smoothly on a bog-standard machine, an interface you could cook an alien egg on, and a large range of missions. Epic-schmepic. This is my idea of a space-combat game (at least until Elite II arrives). Brilliant.

Escape from the Planet of Robot Monsters (Tengen)
A bit old, this, and just slightly sluggish in response, but otherwise it's a picture-perfect rendition of Atari's delightful arcade/strategy game.

Xenomorph (Pandora)
A nice enough sci-fi Dungeon Master clone that's suitable for folks waiting for EOB III. (No atmosphere to speak of, though.)

Escape from Colditz
(Digital Magic Software)
The Adventures of Robin Hood (Millennium)
A pair of charming isometric adventures—the first set in a German castle during World War II, the other in . . . well, you know where the guys in green hang.

Virtual Worlds (Domark)
A nice way to pick up under one roof the four filled-polygon adventures Incentive Software created with its Freescape system—including, delightfully, The Crypt, the sequel to Castle Master, which previously had seen only limited release.

Last Ninja 3
(System 3 Software)
You may think that The Last Ninja was never released for the Amiga. True enough. But three sequels were issued overseas. This is the last and best of the bunch: It's colorful, fun, and challenging. (The controls will elude you for a while, though.)

War Zone (Core Design)
There are a number of good Ikari Warrior updates around—Mercs is another one worth checking out— but this is an absolutely cracking vertical shooter.

Lords of Chaos
(Blade Software)
The folks who did the Breach clone Laser Squad (Microlllusions) didn't stop there. They went on to do this clone of Paladin (the follow-up to Breach), and it's quite sharp-looking, multifeatured, and just complex enough to keep you interested. No editor, alas, and just three scenarios, but this is more involved than Paladin, and the packaging mentions expansion disks. (Here's a twist: Laser Squad is slated to be released in a totally revamped version, via Digitek, and Paladin II is being brought out here by England's Impressions.)

Simulcra (MicroProse)
The much-sought game I mentioned in the main story. Yes, it was worth it.

—P.O. □

Hedgehog is with the Sega Genesis and Mario is with the Nintendo. And if you have a taste for arcade adventures, I can almost guarantee you've never seen anything quite like *Mirrorsoft*'s **First Samurai** or *Team 17*'s **Alien Breed**.

I could go on and on. In fact, I desperately want to go on, because there are things I'm skipping—could I just mention ***Lankhor***'s fast-as-hell racing game, **Vroom**?—and by the time you read this, there will be dozens more arriving in the traditional preholiday feeding frenzy. Moreover, the Amiga abroad enjoys a rich history of top-notch games that can be explored at reasonable prices in rerelease or compilation.

Take a peek at the Bitmap Brothers's puzzle-driven isometric adventure **Cadaver**, ***Loriciel***'s WWII tank game, **Sherman M4**, or ***Infogrames***'s **Quest for the Time Bird** (which will put you pleasantly in mind of Chamber of the Sci-Mutant Priestess). You may be surprised at what you find. If you've ever looked longingly at the bursting IBM shelf in your computer store and wondered what had become of ***Epyx***'s **Omnicron Conspiracy** or ***Access***'s **Mean Street** and **Crime Wave**, well, they did come out, but only overseas.

Likewise, overseas is the only place you'll be able to find ***Mindscape International***'s conversion of Jordan (Prince of Persia) Mechner's splendid isometric puzzle game, **D/Generation** (released in the US only on the IBM). There's a **Turrican II** (still by ***Rainbow Arts***, and even better than the first) available as an import, as well as a **Rick Dangerous II** from ***MicroProse***.

There's also a very Rick Dangerous-ish game called **Switchblade** (***Gremlin***) from the same author. And while it's possible to get lost in the wealth of Dragon-(fill-in-the-blank) games for the Amiga, if you can dig up the massive RPG **Dragonflight** from Germany's ***Thalamus*** label, you may find room in your heart for one more. It's lovely, Ultima-type stuff with numbered houses and a combat mode that puts me in mind of square dancing.

Transatlantic Trade Winds

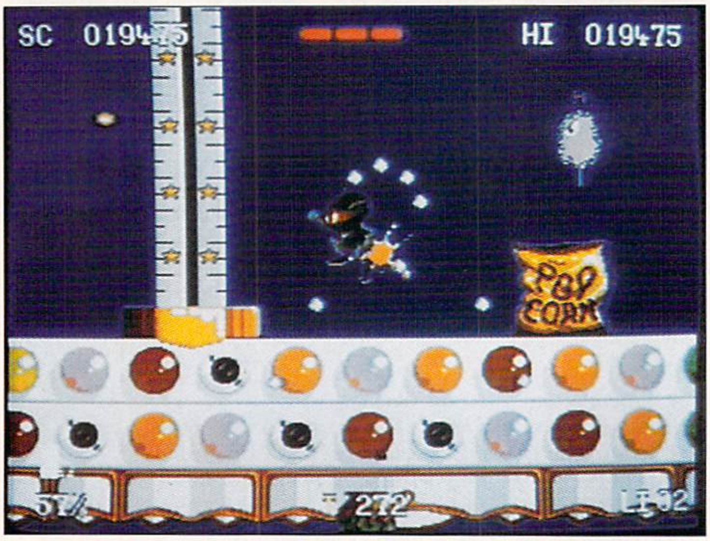
Of course, the Eurocentric nature of Amiga gaming is not exactly new. It's just a bit less well concealed than it used to be. American developers have gone to the ►

European well many times for conversions (from SSI's Pool of Radiance to Origin's Ultima VI) and more and more frequently of late to purchase rights to distribute completed games—a procedure less expensive than developing domestic games from scratch.

GameTek may have brought out the massive, Ultima-inspired RPG **Daemonsgate** and the puzzler **Humans** here by the time you read this, while ***Millennium***'s **Steel Empire** will become **Cyber Empires** when published here by ***Strategic Simulations***. ***Mindscape***'s **The Four Crystals of Trazere** is simply a retitled version of ***Mindscape International***'s **Legend**. Most of the games released in Epyx's glory days in the late '80s were European games. Run your finger down your dealer's Amiga shelf, and you'll see that at least half come from overseas.

For the Amiga, that European connection has grown even more important. England is known for its wet weather, but the Amiga game skies here in the US have been looking a bit gray of late. Yes, the Amiga may be a veritable Rolls Royce when it comes to game-playing potential, but if everyone has a souped-up Trans Am, whom do you think they're going to make parts for? The Amiga's disappointing US sales and the rise of fast 80386-based IBM clone machines as the gaming platform of choice (not to mention the recent release of the 16-bit Super Nintendo) have relegated Our Girl to second-class status in her native land.

Yes, Amiga versions of new games have become a decidedly iffier proposition these days. Strategic Simulations has decided not to port to the Amiga its new Dark Sun:



Gremlin's Zool: A character to rival Sonic the Hedgehog and Super Mario?

Shattered Lands—the first offering in its newest AD&D line—and will address future conversions on a case-by-case basis. Capstone indicates it will not bring over its graphic adventure, The Dark Half. The Amiga version of Mantis, Paragon's would-be Wing Commander killer, has been canceled. Accolade will release The Games: Winter Challenge only overseas. Might & Magic III is likely to be New World Computing's final Amiga conversion.

The market is constricting. Nothing to panic about yet—this sort of thing has happened periodically throughout the Amiga's history—but gamers may wonder where their next toy is coming from. How do you spell relief?

One side effect has been to produce a flow of game-hungry refugees willing to pay premium prices—typically $5 to $10 more for a new game—to import dealers for the latest and greatest European titles. These show up on our shores in ten days to two weeks after overseas release, and they begin to disappear into the hands of ardent gamers primed for their arrival by word-of-mouth from the on-line nets. Arcade adventures. Flight sims. Puzzle games. RPGs. You name it. It's not just a tide—it's a torrent.

When in Britain . . .

It's a whole different world Over There, however, and a little preparation is in order to speak the language. The national obsession in Britain is football (what we call soccer) and there are quite literally *dozens* of football games on the British market. (If you get your kicks from soccer, ***Renegade***'s recent **Sensible Soccer** and ***Anco***'s older **Kickoff 2** have inspired glowing paeans in the British press, and at this writing, a **Kickoff 3** is on the way.)

Cute platform games like ***Ocean***'s **Rainbow Islands** are all the rage. There is a lively market in budget software—typically rereleases of older games or less sophisticated new ones—and a heady number of compilations (relative strangers to the US market, and a nice way to sample lots of older games quickly).

There's also an enormous, vital market in public-domain, shareware, and "licenseware" games—the best of them sometimes virtually indistinguishable from commercial products. You can find at least 20 BoulderDash clones for sale (many using the rudiments of the celebrated Emerald Mines system); SEUCK (Shoot 'Em Up Construction Kit) games so highly polished they shine; a throng of 3D Construction Kit games (the original name for Domark's Virtual Reality Studio); and more Tetris variants than you could shake an "L"-shaped piece at—many of them going the original one better.

You don't have to take my word for it. You can read all about it. While the US market does not yet rate a mass-market Amiga game magazine, England alone has at least three big, glossy, full-color mags dedicated purely to that subject—*Amiga Action*, *Amiga Power*, and *The One*—and a slew of other general magazines (*Amiga Format* and *Amiga Computing* among them) that prominently feature games coverage. *(Note: See the "Eurogames Resource Guide" box for these magazines' addresses and phone numbers.)*

They typically sell for about $10 over here, but that's a bargain when you consider what you're getting: a thick book filled with reviews (sometimes well before a game itself arrives), reports on works-in-progress, interviews with developers, and buyer's guides. And top that off with the usually included two disks packed with playable or "rolling" (automated) game demos, prime public-domain games, and sometimes the odd older commercial game in its entirety. (I've found Rampage, Hardball, Hacker 2, Artura, Purple Saturn Day, and Super Huey this way.)

Caveat Emptor, Guv'nor

A few mind-your-purse caveats for exploring this new turf: Consider that many of the better games will turn up Over Here sooner or later, and that if you're not the ►

I-want-it-and-I-want-it-now type, you may save a few bucks and some inconvenience by waiting. ***Konami***, among others, has made significant strides in signing on English labels—such as ***Renegade***, ***Gremlin Graphics***, and the late, lamented ***Mirrorsoft***—and at press time titles like **Lure of the Temptress**, **Magic Pockets**, and **The Chaos Engine** all were slated for US release in fall '92 or early '93.

Consider, too, however, that it may be months before the domestic version of the game arrives. Typically, the practice has been to wait for the developer to complete the IBM version so as to permit simultaneous release; it's hard to hold on to your money while everyone around you is spending theirs.



Gremlin's RPG Daemonsgate may be out in the US soon.

Note, also, that the American Amiga is a rather more sophisticated animal than its European counterpart, and that European games are often written for the lowest-common-denominator configuration: a 512K Amiga 500. The one-meg game is still something of a rarity. Hard drives, floppy drives, and expanded memory are supported only occasionally, and AmigaDOS is frequently put out with the cat and replaced with developers' custom routines—so you can forget about multitasking.

Moreover, while the documentation may look thick, that's often because it has been printed in four languages. Too often it is painfully brief—the most notorious example being **Captive**, ***Mindscape***'s otherwise-luverly and infinitely large sci-fi RPG. (There's also a D&D-style followup called **Knightmare** that uses the same basic system.)

Another hitch is that European games are usually built to run on PAL-standard machines, which employ a longer vertical display. Often, such games will—all by themselves—lock up US machines (which subscribe to the NTSC standard), run with the bottom half-inch of the display clipped off, or crash in some interesting way. To coax these reluctant critters to run properly, you'll need to boot your machine with a utility disk that effectively camouflages your NTSC Amiga as a PAL machine.

These programs (typically known as PAL booters) can readily be found in the file libraries of public-domain vendors and on-line services such as GEnie, CompuServe, and Portal, or even your local Amiga BBS.

There is a good variety available—you could probably fit 'em all on one disk—and you'll want to experiment to see what works best for you and your favorite Eurogames. (Note, however, that PAL booting programs require a one-meg, enhanced-chip-set Agnes, and that most of them were written specifically for 1.2/1.3 machines. With the appropriate monitor, Kickstart 2.0 machines can be configured to boot in PAL mode; check out the AddMonitor section in your manual.)

I've successfully used PALboot and PALboot 2.0 (which offers five boot modes) and the Turbo PAL/NTSC Boot Program (which offers four), and I have at least seen these others: Michael Knurck's Video Mode Switch (which has a convenient Workbench gadget); Nico Francois's AmigaToPal (which requires Kickstart 2.0); Leo Schwab's BPD (for "Boot PAL, Dammit!"); Christian Warren's Switch Install; PALfix (custom system-configuration files that kick up the screen); BootPAL; TAL's Super Pal; Greg Cunningham's PALInsert; and Oliver Wagner's PatchNTSC (which patches Intuition so that screens with a height of more than 216 pixels open in interlace).

One particularly well-regarded program—especially for use with upgraded machines—is Chris Hames's Degrader. It offers PAL and NTSC options, but it also provides a range of others for turning off fast memory and the burst and cache modes available with '020 and '030 processors and for intercepting instructions privileged on processors above the 68000.

Seek and Ye Shall Find

European games may also be a little hard to find. They aren't likely to turn up in any but the most enlightened of chain stores. A more likely route is mail-order businesses that specialize in imports or independently owned software stores. Many vendors here will handle at least the hotter imports—there's been lots of interest in Ocean's Epic, for instance—and some deal in them quite heavily. (Florida's ***Sideline Software*** is a good example—*see the "Eurogames Resource Guide" box for the address and phone number*.)

Also, you can always go to the source and order direct from mail-order businesses overseas. That may be the only reliable way to find older titles. I can't recommend any from extended personal experience, but there are dozens listed in the UK magazines, and you can compare prices before you call. (An illustration: I looked high and low in the US for a polygon-filled arcade/strategy game called **Simulcra** before finding it for £7.99—about $16—in a mail-order budget bin.)

Bear in mind that UK time is five hours ahead of Eastern time and eight ahead of Pacific time, so it may pay to call at off-peak periods in more ways than one. However, my five- to ten-minute direct-dialed calls to the UK during US business hours have typically worked out to a little over $1 a minute. Not too bloody shabby.

Finally, as with any embarrassment of riches, there's bound to be a good deal of iron pyrite among the gold, so look before you leap. Check out the UK magazines first. Ask your dealer what's good.

European labels seem to release more junk than their American counterparts (perhaps because the ►

EUROGAMES RESOURCE GUIDE

Access Software
4910 West Amelia Earhart Drive
Salt Lake City, UT 84116
Tel: 801/359-2900

Amiga Action
Europress Direct
FREEPOST
Ellsmere Port
South Wirral, L65 3EB
England
Tel: 0625-878888

Amiga Computing
Europress Publications
Europa House
Adlington Park
Macclesfield SK10 4NP
Cheshire
England
Tel: 0625-878888
051-357-2961 (subscriptions)

Amiga Format
30 Monmouth St.
Bath BA1 2BW
England
Tel: 0225-442244
For subscriptions:
The Old Barn,
Somerton
Somerset TA11 7PY
England
Tel: 0458-7401

Amiga Power
see Amiga Format

Anco Software
7 Millside Industrial Estate
Lawson Rd.
Dartford
Kent DA1 5BH
England
Tel: 0322-292513

Coktel Vision
Address Unavailable

Core Design
Tradewinds House
69/71 Ashbourne Rd.
Derby DE22 3FS
England
Tel: 0332-297797

Domark
Ferry House
51-57 Lacy Rd.
Putney
London SW15 1PR
England
Tel: 081-780-2222

Electronic Arts
90 Heron Dr.
Langley
Berks SL3 8XP
England
Tel: 0753-549442

Epyx
600 Allerton St.
Redwood City, CA 94063
Tel: 415/368-3200

GameTek
2999 NE 191 St., Suite 800
North Miami Beach, FL 33180
Tel: 305/935-3995

Gremlin Graphics Software
Carver House
2-4 Carver St.
Sheffield S1 4FS
England

Infogrames
18a Old Town
Clapham
London SW4 0LB
England
Tel: 071-738-8199

Konami
900 Deerfield Pkwy.
Buffalo Grove, IL 60089
Tel: 708/215-5100

Lankhor
84 bis
avenue du General-de-Gaulle
92140 CLAMART
France

Loriciel
7 rue du Fosse Blanc
92230 Jennevilliers
France
Tel: 331-4688-2838

MicroProse
Unit 1
Hampton Road Industrial Estate
Tetbury
Glos GL8 8LD
England
Tel: 0666-504326

Millennium
Quern House
Mill Court
Great Shelford
Camb CB2 5LD
England
Tel: 0223-844894

Mindscape International
Priority House
Charles Ave.
Maltings Park
Burgess Hill
West Sussex RH15 9PQ
England

Mirrorsoft
Out of business

Ocean Software
6 Central St.
Manchester M2 5NS
England
Tel: 061-832-6633

Psygnosis
South Harringdon Building
182 Seffton St.
Liverpool L3 4BQ
England
Tel: 051-709-5755

Rainbow Arts
Skety Close
Brackmills Business Park
Northampton NN4 0PL
England
Tel: 021-702-2323

Renegade
C1 Metropolitan Wharf
Wapping Wall
London E1 9SS
England
Tel: 071-481-9214

Sideline Software
840 N.W. 57th Court
Fort Lauderdale, FL 33309
305/491-0398

Silmarils
22, rue de là Maison Rouge
77185 LOGNES
France

Storm
Unit 17
50 Lombard Rd.
London SW11 3SU
England
Tel: 071-585 3308

Strategic Simulations
675 Almanor Ave., Suite 201
Sunnyvale, CA 94086
Tel: 408/737-6800

Team 17 Software.
Prospect House
Borough Rd.
Wakefield
West Yorkshire WF1 3AB
England
Tel: 0924-291867

Thalamus Europe
Unit 29
Riverside Business Centre
Victoria St.
High Wycombe
Bucks HP 11 2LT
England

The One
PO Box 500
Leicester LE99 0AA
England
Tel: 0858-410510
0858-410888 (credit-card order line)

Virgin Games
338 Ladbroke Grove
London W10 5AH
England
Tel: 081-960 2255

Note: The source for the developers in this list is the Amiga Format Special Issue, *Autumn 1992.* □

Americans have the luxury of picking over the choicest European releases) and are more heavily given to buying licenses from movies and television. The Munsters, Night Breed, Hill Street Blues, The Running Man, Total Recall, Hudson Hawk, and The Adams Family are just a few that come to mind. Some of these, like **Robocop 3** (which has beaten the movie to release) and **The Blues Brothers** (which followed the movie by years), are superb, but others aren't even fit to be reformatted.

Come to think of it, even Steven Spielberg's **Hook** has made it to the Amiga in the form of a pleasant Monkey Island-like graphic adventure from ***Ocean***. And even though Peter Pan here turns out to be an adult yuppie suffering a mid-life crisis, somehow this game seems to be the perfect ending to the journey we began at the beginning of this article—and a perfect starting point for your own excursion to Never Never Land. Why don't you join Peter and company there? It may seem right beyond the moon, but it can be right there where you sit. Dress warmly. Take your toothbrush. And don't forget to pack your Amiga. You may never ever go home. ■

Peter Olafson is a contributing editor to AmigaWorld, *writes the monthly "Crib Notes" and "Short Takes" in* AW's *"Game Preserve," and generally knows more about Amiga games than any six people we know. He is sometimes seen in a very recognizable green outfit flying above the Manhattan skyline trying to decide whether there's a percentage in growing up. Write to him at 25 Belmont Ave., Madison, NJ 07940.*

CLAYMATION EXCITATION

Achieve Hollywood-style animation results with these clay-animation techniques for the Amiga.

By Gene Hamm

TRADITIONAL STOP-MOTION clay animation is a tried-and-true professional technique for creating wonderfully realistic animated characters whose movements are fluid and natural. The only trouble is that it is laborious, back-breaking work. I can tell you that from experience, having done a long stint of it working on the "Gumby" television series.

The good news is that your Amiga can help. Six months before the end of Gumby, I bought an Amiga. All day I would work on Gumby and all night I would learn how to animate on the Amiga. Living in those parallel worlds, I began to see how the Amiga could make stop-motion animation easier and far less time-consuming. The secret lies in digitizing the movements of a clay model you can build yourself.

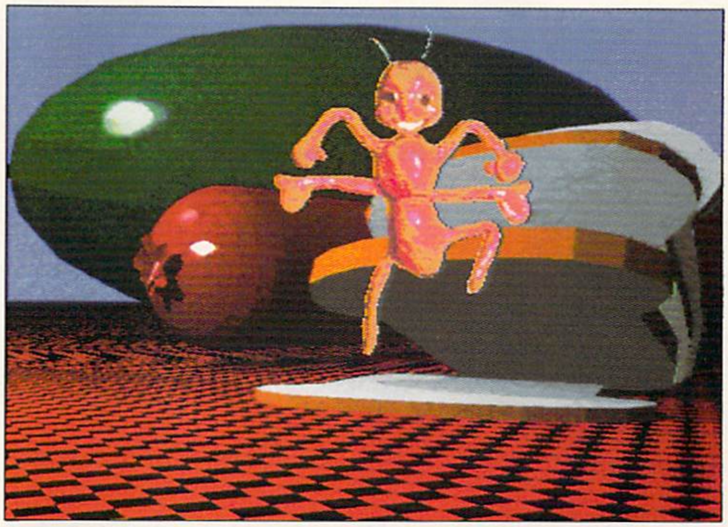
Old-Fashioned Blood, Sweat, and Tears

First, though, let's take a look at traditional clay animation—or "claymation," for short—to get an understanding of the basic process to which we will apply a little digital streamlining later in the article.

On The Gumby Show, as in most clay animation, clay puppets were moved one frame at a time on big tabletop sets. Before Gumby, my experience was with cel animation, in which you work in two dimensions and don't have to deal with the physical realities of a three-dimensional world. You can simply draw whatever you want (no matter how physically impossible). Attempting the same kinds of shots in three-dimensional clay animation, however, would require complicated rigging.

Compared with cel animation, everything is harder in clay animation. There are no walk cycles to save you having to animate every single frame of the walk into the scene. You constantly have to worry about gravity; characters are always falling over in mid-shot and ruining scenes. Even simple running or jumping requires that the character be suspended in mid-air with wires. (Although many animators usually settle for a ground-hugging scurry, where the character slides fast, or they avoid animating the legs at all by shooting walks in a close-up.)

Flying shots are extremely difficult because the character has to be suspended by wires for every frame. Although there are many tricks you can pull out of your



bag, you are constantly worrying, on the one hand, whether the wires are strong enough to hold the weight of the puppet, and, on the other, whether they're thin enough not to be seen by the camera.

Also, when you have a scene where the set is two tables wide and the character is right in the middle of the set, you will find yourself caught up in an exhausting ritual. Unlike cel animation, there is no "tweening" between key frames. You must lean over the set to move the character, walk back to the camera, shoot a frame, walk back to the set to move the character again, and so on all day long until the shot is complete. It *is* back-breaking work.

Tools, Character, and Set

I hope this description has not scared you away from attempting clay animation. Remember, we said in the beginning that the Amiga could help you. All the problems I have listed can be solved with the Amiga.

The basic tools required are a digitizer, a camcorder, and a paint program. Add a ray-tracing or other 3-D package if you want to create a 3-D background for your character (although this is not necessary if you simply use a flat background).

I find ***A-Squared***'s **Live!** to be the easiest and fastest digitizer to use in my work. However, since this is an ►

older Amiga product, you may prefer to use ***NewTek***'s **Digi-View** (although you have to deal with its somewhat cumbersome filters) or almost any other framegrabber. If you work with Live!, you may find that ***Elan***'s **Performer** also comes in handy (which I'll talk about later). For the paint program, I use ***Electronic Arts***' **Deluxe-Paint IV**. *(To locate the vendors of products mentioned in this article, see the "Manufacturers'/Distributors' Addresses" list on p. 117.)*

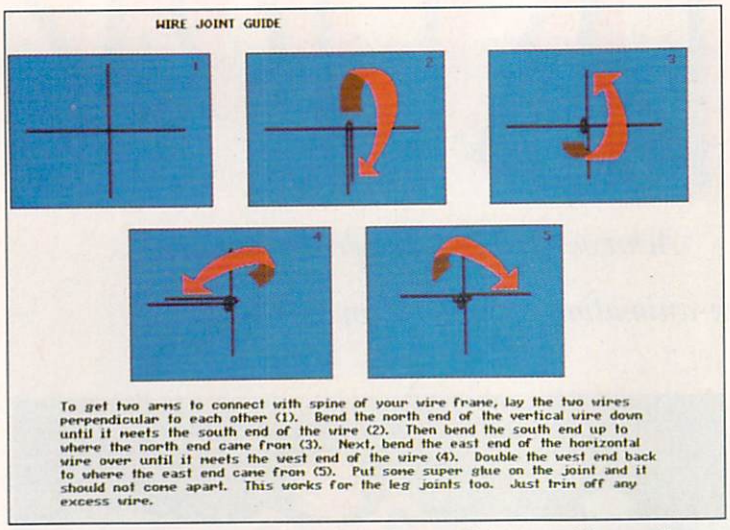


Figure 1. Basic guide to assembling the wire joints used in creating an armature for the model.

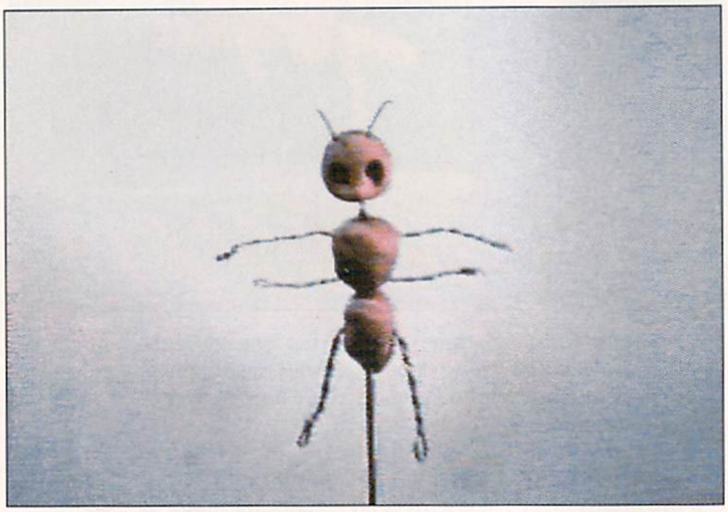


Figure 2. The model starts with a wire armature around which only the most basic body parts are molded.

Before you can animate, you must have a character. You could take the easy way out and use some ready-made action figure, but then your animation would look like those of everyone else who took the same shortcut. And if your animation is shown anywhere, it may result in a copyright violation. If you want a character that does not look like just any ready-made action figure, you can build your own clay puppet from scratch, using inexpensive armatures. You need some aluminum wire (aluminum allows for more bending than steel or copper), some Super Sculpey (commonly available at art-supply stores), two small blocks of wood, and clay.

In designing your character, keep in mind that because it will be suspended, you are free from considerations of gravity and distribution of weight. So let your imagination go. Notice that the feet of the ant in my illustrations would not support him if you stood him up on a table, but as he will be a brush on the Amiga, he can defy the laws of physics. He could even have no legs at all and just hover above the ground.

The simplest wire armature looks like a skeleton. Figure the length of the spine and cut the wire twice as long. Bend the wire back so the ends meet and twist it so it is double strength. (See Figure 1 to learn how to put wire joints together.) After the wire armature is built, mold the head, thorax, and abdomen out of Super Sculpey, and then fit it around the wire (see Figure 2). These are the parts that hold their shape. For the head, use Super Sculpey only on the skull and eye holes. On the movable parts of the face, such as the mouth and cheeks, just use clay.

Poke a hole in the puppet where it will be suspended and put it in an oven or toaster oven for five minutes at 275 degrees. The Sculpey should come out hard, but not brittle. When it cools, put the clay on it. For eyes, use a package of beads from a fabric store. Sticking a toothpick in the hole in the bead and dipping it in a puddle of black paint gives you a perfect pupil for the eye. When the paint dries, poke the hole in the center of the pupil with the toothpick and place it in the eye socket. When animating, you move the eyes with a toothpick placed in the pupil. (See Figure 3 for a look at the now-completed ant.)

You could use wood instead of Super Sculpey if you have the woodworking tools to shape the pieces. If you build a wooden head, thorax, and abdomen, drill holes for the individual arms and legs and the spine. The holes do not have to go clear through the wood; shorter sections of spinal wire can connect the pieces.

If your animation requires a 3-D background, use your 3-D program to construct your set. (I used ***Byte by Byte***'s **Sculpt 4D** to create the background for my ant in the opening illustration. See Figure 4 for a look at the background without the character.)

As the background is ray-traced, you might well ask why the character is not ray-traced also. It is my contention that digitizing a clay character can achieve more subtlety of emotion and fluidity of animation than could be achieved by trying to do it in a ray-tracing program. Even if ray-tracing could achieve the same complexity as hands-on animation, you can animate digitized clay characters ten times faster than ray-traced characters. Ray-tracing's strength is still in creating backgrounds and props.

Claymation Time!

You are now ready to break the shackles of gravity with a little Amiga claymation magic. Shoot the character in simple contrast against a single background color that can be stenciled out later in DeluxePaint IV to leave just the character, which you can then save as an animbrush and placed in the scene with the Move requester. The character can also be genlocked over a previously videotaped background to save memory.

You will need a frame to support your model while you shoot. Use a wire spindle with a wooden base that's taped securely to a tabletop, and then impale the clay character on the spindle. Patting some clay around the ►

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hole will keep the character from moving when you don't want it to.

After framing the character in the video camera to your satisfaction, adjust Live! accordingly. I like to work in interlace (F5) in simple color (F2). In the Live! Display menu, interlace appears numerically as 320×400.

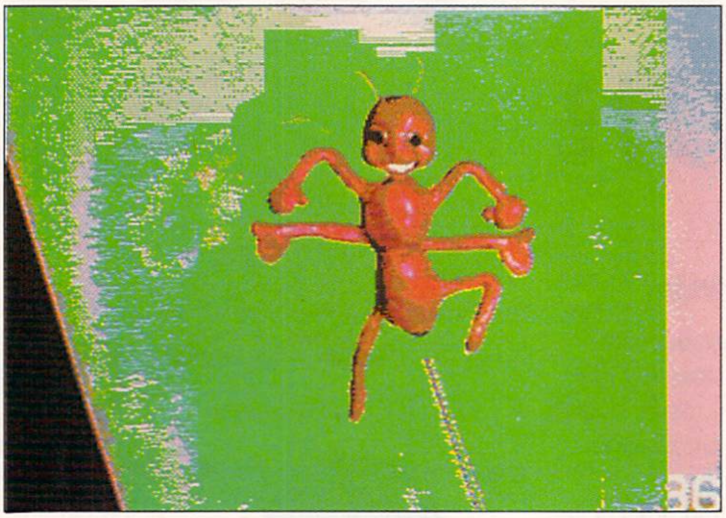


Figure 3. More detailed parts and features are added with clay and common household items to produce the finished model.

Go to the Controls menu to adjust the video signal (F6). With enough light on the subject, working with 32 colors can produce quite realistic results. You can save some memory by not turning on overscan—the character will eventually be an animbrush, anyway.

You could click off individual frames with the spacebar, but this is likely to interrupt your concentration, as you have to name the file and save it for every frame. An easier way is to set the number of frames in the Capture menu and click off frames with the a key.

An excellent resource to help you learn how to shoot a clay run cycle is Preston Blair's *Cartoon Animation* (***Walter Foster***). Look at the page of walks and runs and bend your character's arms and legs into the positions you see. The book shows them from the side, but you can move your character from the side while you shoot from the front or from three-quarters. When you finish shooting the cycle, save it in the Capture menu and then press F10 to play it back. It will look as though the puppet is riding an invisible bicycle. (For further help here, refer to my article, "Walking in Cycles," on p. 55 in the *1992 AmigaWorld Video and Animation Special Issue.*)

LET'S GET ANIMATED!

The animation is now a Riff file, a file unique to Live!. There are two ways to turn it into an ANIM that can be used in DeluxePaint IV. If you have the time, quit Live! and return to the Workbench, where you will find the Playriff icon in the Live! window. Double-click on Playriff to obtain a menu that allows you to load the Riff, play it, move through it frame by frame, and save individual frames as IFF files.

You can then load the individual IFF files into DeluxePaint IV through the Picture menu by setting the number of frames and clicking on the first frame of the animation. Once it's loaded, you can save it as an ANIM. If the Riff is only a few frames, this method works fine, but with many frames, it can get tedious, and you can easily forget where you are, thereby missing something.

An easier method is to exit Live! and load your Riff into Elan's Performer. After assigning the Riff to a key, you can save it as an ANIM. You can then load it into DeluxePaint IV and clean it up until the background is gone, leaving only the character. Now you can save it as an animbrush, which allows you to address a major problem of movement we have neglected.

Because the original puppet was suspended in midair on a spindle, there was no provision for up-and-down body movement. To achieve this, activate the Grid, setting X to 16 and Y to 1 so the brush can be moved up and down but not sideways. Load the animbrush and,s if you need assistance, look at the run in the Preston Blair book to see where the feet should be placed. Notice when the feet are in contact with the ground and when they aren't. If you carefully lay each brush on each successive frame, you should wind up with a run that has the proper up-and-down body movement. Save it again as an animbrush and use the Move requester to move it around the screen.

Flying shots are even easier. Because the feet never make contact with the ground during the wing-flapping cycle, you avoid the extra step of registering the feet to the ground. Keep the character in motion, even when it isn't moving. If you have a shot where the character stands still, shoot three or four frames of it and play them back in random order for a moving hold. The pixels will dance and make the character look alive as opposed to the way it would appear in a dead freeze frame; also, this helps disguise the fact that you used only 32 colors.

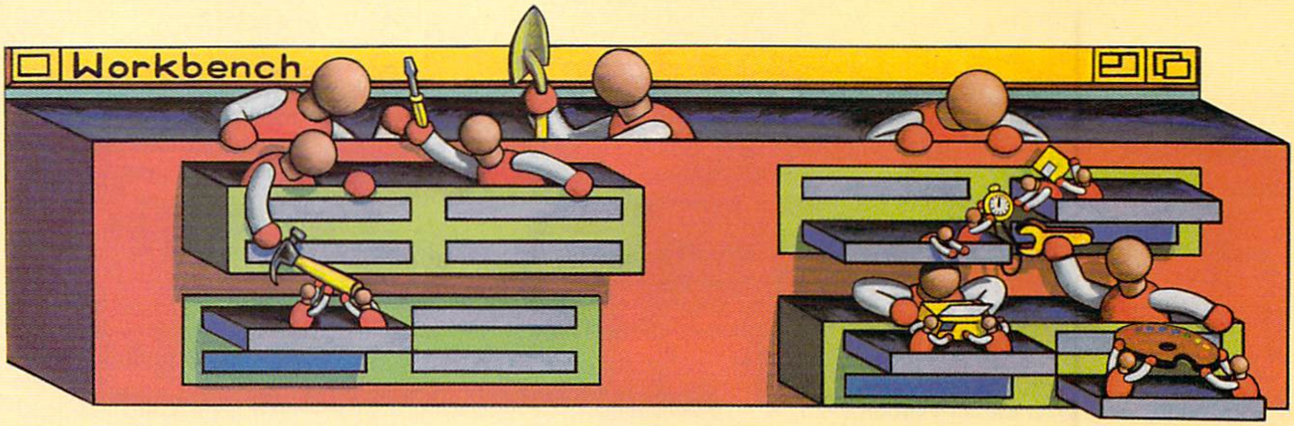
If you are using a 3-D background and you have enough memory, you can lay the character over a ray-traced background. But to save memory, I suggest recording the ray-traced background on videotape and then genlocking the character over it. You can also use live action for the background. This allows you to have stop-motion characters interact with real people, as Ray Harryhausen did in such films as *The Seventh Voyage of Sinbad*, and *Jason and the Argonauts.*

Another choice, depending on the amount of memory you have, is to use ***Elan***'s **Invision Plus** to run your Live! digitizer. You can customize the capturing and playback modes of Live!, adding, say, 64 colors or hi-res. Invision Plus saves frames as ANIMs, so you don't have to deal with Riff conversions.

These techniques provide a good image that you can achieve quickly and take straight to videotape in real time. If you want a higher-quality image, however, try the following: After creating your animation with Live!, run your combined video of character and background through ***Digital Creations***' **DCTV**. With each frame individually bumped up to 24 bits, you can transfer them to videotape with a single-frame transport controller. (You could use DCTV for your original digitizing—skipping Live! altogether—but it would take much longer and consume an enormous amount of file space.)

Now you know some Hollywood tricks for doing clay animation, but even Hollywood could learn some tricks from the Amiga. ■

Gene Hamm is a veteran animator who works for Colossal Pictures. His past credits, as you know by now, include work on The Gumby Show. Write to him c/o AmigaWorld *Editorial, 80 Elm St., Peterborough, NH 03458.*



Digging in to DOS

A SERIES THAT EXPLORES THE AMIGA'S RELEASE 2 DISK OPERATING SYSTEM

Part two takes a look at some of the sleight-of-hand maneuvers 2.0 lets you perform in the all-new Shell game.

While it is widely known that Release 2 of AmigaDOS makes Workbench more powerful, allowing you to perform almost any operation without using the CLI or Shell, few people realize that 2.0 enhances the Shell almost as much. In this and the next installment, we'll examine some of these Shell improvements. You will see that they are quite broad in scope, ranging from the Shell window, to the environment handler, to individual CLI commands.

SHELL DOES WINDOWS

The Shell uses the console device for its window, and under 2.0 the default console window has a close gadget. This means that you no longer have to type ENDCLI or ENDSHELL to get rid of a Shell window. You can just click on the close gadget or, if you're a mouse hater, type the end-of-file character CTRL-\ (hold down the Control key and press the backslash key, located just under F10).

In fact, the new console description can specify a number of window options, using such keywords as CLOSE (for the close gadget), NODRAG (to eliminate the drag bar), NOSIZE (to eliminate the size, zoom, and close gadgets), NOBORDER (to eliminate the border lines), and BACKDROP (to make it always appear in the back). So, if you want the system to open a full-screen Shell window on a noninterlaced Workbench screen with no borders and close only depth-arrangement gadgets, you can use the command

```
NEWCLI con:0/0/640/200/AmigaShell/NOBORDER/NOSIZE/
  NODRAG/CLOSE
```

or enter the line

```
window=con:0/0/640/200/AmigaShell/NOBORDER/NOSIZE/
  NODRAG/CLOSE
```

in the ToolTypes window on the Shell icon's Information screen.

There are some other interesting ways to customize your Shell window under Release 2. Although the Shell normally uses whatever typeface you select as System ►

BY SHELDON LEEMON

ILLUSTRATED BY BARTON STABLER

Default Text from the Font Preferences program, you can change the font used in a single Shell window with the new SETFONT command.

The SETFONT command not only allows you to use fonts in existing sizes, but to create new sizes of bitmap or Compugraphic-outline fonts with the SCALE option. For example, "SETFONT Topaz 16 SCALE" creates a font that is twice the size of Topaz 8. If you wish, you can add a SETFONT command to your s:shell-startup file, so that all of your Shell windows come up with a font other than the system default.

Under the forthcoming Workbench 2.1, you will also be able to set the keyboard mapping of each individual Shell window, using the SETKEYBOARD command. This lets you try out a foreign-language keyboard layout in a single Shell window without changing the keyboard layout used by every application in the system.

Console editing has been improved in small ways, also. You can now use the standard CTRL-S key combination to pause the screen listing and CTRL-Q to restart it. This is a welcome replacement for the nonstandard (and somewhat annoying) method of using the space key to pause and backspace to restart.

Further, the console window has joined the mouse era to the extent that you can use it for copy and paste operations. Dragging the mouse across text in a console window (such as the Shell window) now highlights the text. Pressing Right Amiga-C copies the highlighted text into the clipboard device. Right Amiga-V pastes the text back into the active console window.

Not only can you copy text from one Shell window and paste it to another, you can also copy text between any two applications that use a console window (such as the More text viewer program in the Utilities drawer, and the Ed text editor in the C directory). This means that you can paste a directory listing from your Shell window into a document that you are editing with Ed. Using Carolyn Scheppner's Conpaste commodity, you can paste clipboard text into any application, as if it were being typed in from the keyboard.

Various Variables

The concept of environment variables—text strings you can store and retrieve in a standard manner—has been greatly extended. In addition to global variables, which are created with the SETENV command, stored in the Env: directory, and accessible via any Shell or other program, there are now local environment variables. These, produced using the SET command, are meaningful only to the Shell in which they are created.

Under 1.3, you could retrieve the text contents of an environment variable only by using the GETENV command. Under 2.0, however, putting a dollar sign in front of the name of an environment variable instructs the Shell to replace the sign and variable name with the text contents of that variable. For example, if you create an environment variable named Editor with the command

```
SETENV editor Memacs
```

then any program can tell that your preferred editing program is Memacs.

Moreover, any Shell command that uses the expression $Editor will have that expression replaced by the string "Memacs". Therefore, if a Shell command or script uses the line

```
RUN $editor textfile
```

the Memacs program will be run, and it will load textfile. If you decide at some future time that you prefer another text editor, you can use SETENV to change the Editor variable to the name of that program. Then your script will run the new program, even though you have not altered the script.

This example was not chosen at random, by the way. Under 2.0, the global variable "Editor" is recognized by some of the Workbench programs such as More. If you set this variable to the pathname of your text editor, More allows you to bring up the program to edit the current file by pressing Shift-E.

Under Workbench 2.0, there are a number of significant local environment variables that are automatically set for you, or that you can set yourself. These include Process, which holds the process number of the current Shell; RC, which holds the return code of the last command that was executed; and Result2, which contains the error code for the last command.

You can use RC to examine return codes without using the IF WARN and IF FAIL commands that are available only in script files. If you are not familiar with all of the DOS error codes that Result2 may return (and who is?), you can use the FAULT command to interpret them (just type "FAULT $Result2"). Workbench 2.0 also sets up a couple of global environment variables called Kickstart and Workbench, which contain the version numbers of the Kickstart and Workbench that you are using.

A new local environment variable, Echo, borrows a feature from MS-DOS. Entering "SET Echo ON" causes each command line of a script file to print before execution. If you set Echo to anything else (or don't set it at all), you will not see the commands as they are executed. Turning Echo on is a good way to debug scripts that don't work, as the faulty command line prints at about the same time that the error message appears.

Got a Match?

Another Shell option expanded under 2.0 is pattern matching, which allows you to specify a number of files at one time by similarities in their file names. One of the handiest of these new patterns is the tilde character (~), which acts as a NOT operator. Under the old system, it was easy to list all of the icon files (the names of which end in .info), but not so easy to list all of the files *except* the icon files. Now, you caneasily perform this latter task with the command "DIR ~(#?.info)."

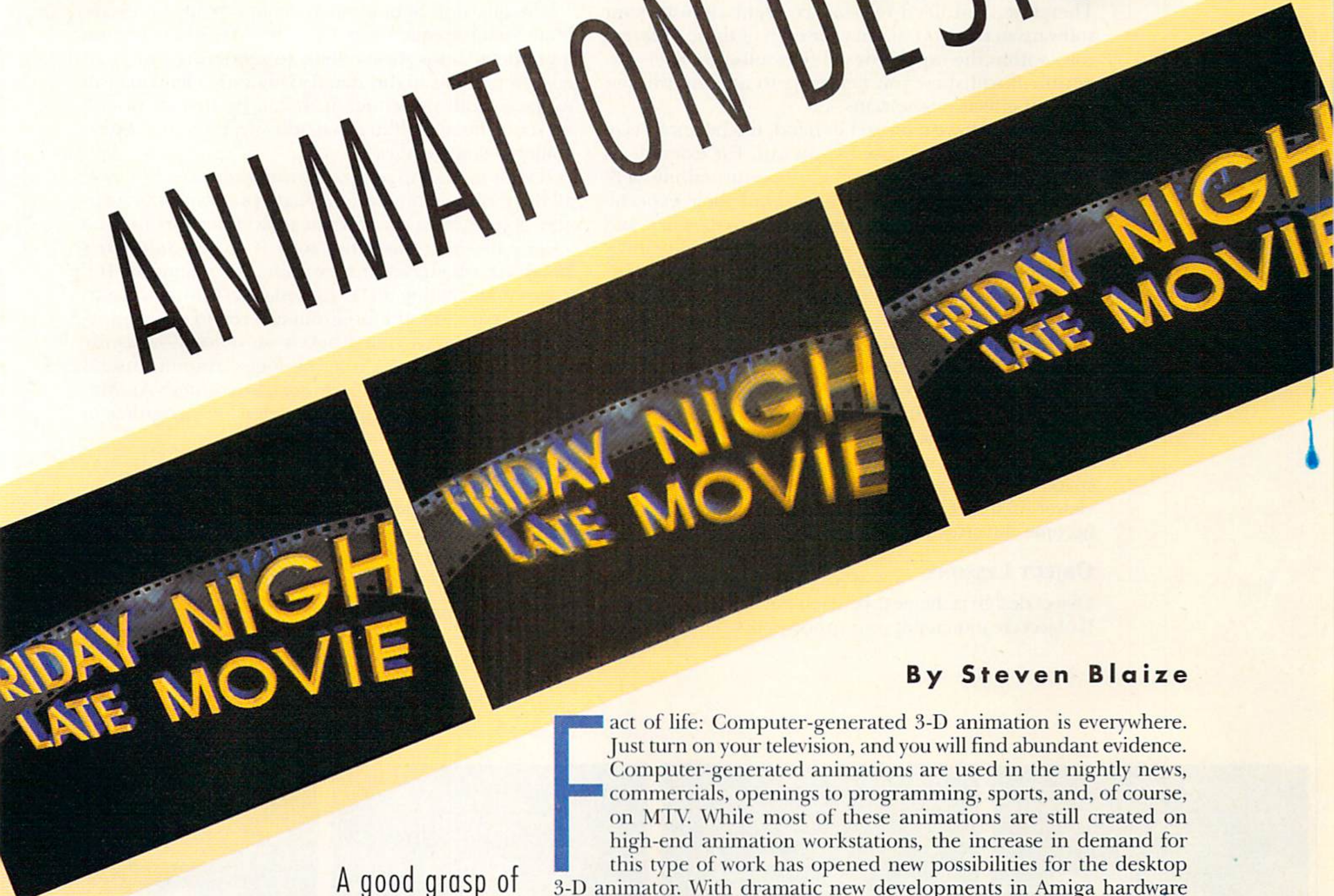
Another new pattern uses the dash character to separate a range of letters between brackets. To list all of the files in the C: directory that start with the letters a through c, for example, you could use the command "DIR C:[a-c]#?."

Finally, 2.0 has added the ability to use the asterisk as a "replace anything" character, just as it is used in MS-DOS. To maintain compatibility, however, this feature is available only when activated by a program such as the public-domain Wildstar or Starburst programs.

These examples are only a few of the many Shell changes. In the next column I'll discuss more, including the backtick feature and some of the powerful new options that were added to the CLI commands themselves. See you then. ■

Sheldon Leemon, a respected authority on the Amiga, is currently finishing a book about Workbench 2.0. You can find him at Slipped Disk, a Detroit-area Amiga dealership.

3-D Keys to ANIMATION DESIGN



A good grasp of the basic principles of 3-D design will get amateur animators moving in the right direction.

By Steven Blaize

Fact of life: Computer-generated 3-D animation is everywhere. Just turn on your television, and you will find abundant evidence. Computer-generated animations are used in the nightly news, commercials, openings to programming, sports, and, of course, on MTV. While most of these animations are still created on high-end animation workstations, the increase in demand for this type of work has opened new possibilities for the desktop 3-D animator. With dramatic new developments in Amiga hardware and software—plus the fact that what is created on the Amiga is much easier and cheaper to output to video—Amiga-generated 3-D is clearly competitive with that produced on dedicated workstations.

The demand for all this new razzle-dazzle also underlines an even more important demand: the need for better and more sophisticated computer graphic design. So, before we all scurry off like lemmings to jump headlong into 3-D graphics and animation, let's take a few moments to cover some design concepts you may find useful in developing your 3-D animations. (You may also wish to review a similar article that ►

Phil Fitzpatrick wrote for *AmigaWorld*'s February '92 issue on 2-D graphics—see "Amiga Image-Making: Creative Methodology and Graphics Technology," p. 30. Much of the material on general design is applicable to 3-D, as well.)

(To locate vendors of the products mentioned in this article, see the "Manufacturers'/Listributors' Addresses" list on p. 117.)

Advance Planning

The first principle of 3-D design might best be characterized as "predesign" planning, which involves several different factors. To begin with, you need a good understanding of the entire 3-D animation process. In general, 3-D animation is a considerably greater task than 2-D animation. You have to function as a one-person movie producer, director, actor, lighting technician, set designer, editor, and even janitor!

To wear all these hats, you must have a thorough understanding of the program or programs you are using. Therefore, you need to practice regularly with your software so that you can master each of these different roles within the capabilities of that software. Every experiment will show you new ways to accomplish new types of effects or shortcuts.

When you have a project in hand, the next step is to plan as much in advance as you can. For example, if you have clients who want their logo turned into a 3-D animation, talk to them first about their expectations, see if they have video of other logos they like, and get the object approved before starting any animation. Often, ideas in a client's mind are dramatically different from the ultimate output you will produce. In addition, try to get models or pictures of the real objects as a help in verifying scale and proportions.

You should also realize that your 3-D creations are going to be viewed on a 2-D surface. This is true whether your eventual output format is video, computer presentation, or even print. This means that your design must take into account movement within a 3-D space and the capability to show that space to your viewer on a 2-D surface. Your predesign planning can become the critical element in your project.

Object Lessons

Object design is the next key element in 3-D animation. If object creation is not your strong point, the good news is that the growing demand for 3-D animation is stimulating the market for 3-D clip objects—in much the same way that desktop publishing created a market demand for ready-to-use clip art. If you do not have the talent or time to create objects from scratch, you can still utilize 3-D objects in your animation projects. (See the relevant 3-D sections in *AmigaWorld*'s clip-art buyer's guide, "Art in an Instant," Jul. '92, p. 30, for source material.)

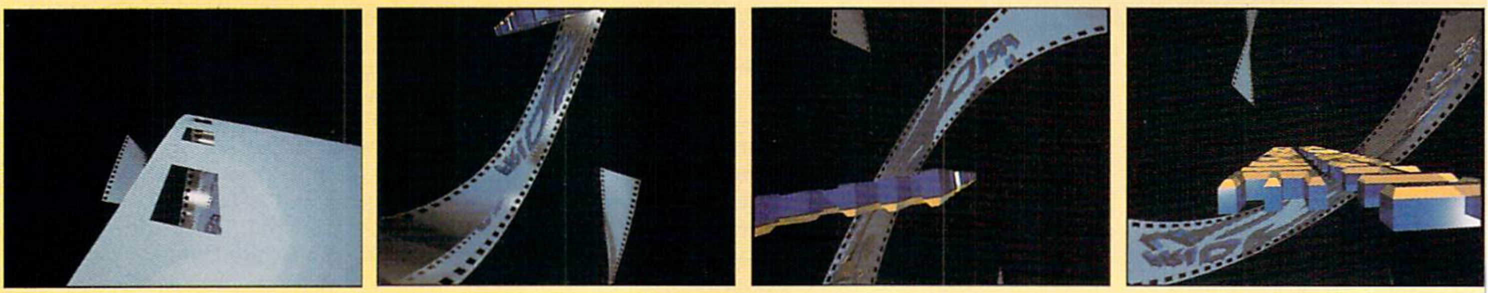
Whether you use predesigned objects or create them yourself, there are some rules of thumb you should follow: Always try to break down the object into the smallest detail necessary for the project. For instance, when creating an automobile, it is easier to create the tires separately from the hub caps. Also, add only as much detail as required. Again referring to the automobile example, if the animation is above and around the car, the detailed tread on each tire is not essential. If your focus is on a victim being run over by the car, you may want that tread detail in a close-up view.

The question of how much detail is really necessary is one that is frequently debated by 3-D artists, because more detail adds substantially to rendering time; yet, it is often subtle, highly detailed items that lend realism to the overall presentation. It can be that extra wall socket or floor molding that adds warmth and believability to your images.

If your modeling program or module does not have all the tools you require, there are programs that convert objects from one format to another for use in a variety of situations. One such is ***Axiom Software***'s **Pixel 3D,** which is also very useful for tracing an IFF image and creating 3-D extruded objects from the outline. In addition, the program can retain color information as well as create bevels on objects—a handy feature when you are creating logos. Another useful program in this respect is ***duBois Animation***'s **AniMatrix**, which is a dedicated modeler for designing in real-time perspective.

The Right Look and Feel

There is a second aspect to the object-creation process that requires equally careful attention and planning. After you create your object's shape, you must define its surface(s). This process is called image—or texture—mapping. There are several different kinds of mapping, each one with its own set of procedures and



techniques. (For a good introduction to texture mapping, see the article "'Mapping' New Worlds," Feb. '92, p. 50.)

For our purposes, let's take a look at one surface texture avidly sought in today's 3-D market, but difficult to execute effectively: metals. In general, an object like a logo with a metallic surface will look more impressive if it is moving—as in the popular flying logo—rather than stationary. This is because we see the reflections and the colors changing as the object moves. Why then are metals so hard to create? The reason lies with those reflections.

Metals may have their own inherent colors, but we recognize them as metals because they reflect the environment around them. One way to achieve this effect with your computer-generated creations is to simulate reflections of real-world images on your 3-D objects through careful—and often painstaking—mapping techniques.

A hint for working with metals is to make sure that you have set some amount of reflection/shine on the surface of your object (some programs may require additional settings) and that you also have a proper environment (colors, images, objects, textures, and so forth) that the object can reflect. In addition, pay attention to variations in the colors of your objects.

Take a look at print ads or billboards that use gold or chrome letters. Each letter will be made up of at least three colors. The bottom part will be dark, the top a lighter shade, and the middle a band of very light color. Keep this in mind when you establish your environment. Many times you will not need to do any time-consuming ray tracing, as programs like ***NewTek***'s **LightWave** and ***Impulse***'s **Imagine** provide environmental mapping without ray tracing. (For a detailed look at reflection-mapping techniques, see "Reflection-Mapping Magic," 1992 *AmigaWorld Special Issue*, p. 69.)

Getting away from metals and reflection mapping, there are a host of other surfaces that can help lend realistic detail to your 3-D objects. Examine the range of texture-mapping functions offered by different 3-D programs to see which ones offer the kinds of surfaces you want. Some textures are easy to create, while others require difficult manipulation of your program.

If you find you are having trouble creating your own, there are quite a number of ready-made textures and backgrounds available. Start your search by referring to the "Art in an Instant" buyer's guide cited earlier in the article and to the sidebar on ready-made textures in the "'Mapping' New Worlds" article mentioned above in this section.

GETTING YOUR MESSAGE ACROSS

For some people, the next key design element—the story—may be something they might wish to concentrate on before they create objects and worry about surface textures. Fine. Yet, there are also cases—like producing an animated sequence with a client's logo—where you need to create the objects with which you will be working *before* you start planning what you will do with them.

So you are now ready to put your objects together into a story that will convey a message. Your message is very important and needs careful thought and planning—whether your project involves entertainment, a business presentation, an advertising campaign, or pure artistic expression. Also, remember that you are creating this animation for a viewer, so keep your viewer in mind as you design the movements.

A standard animation technique to use here is to create "storyboards." These may be as formal or informal as needed, but you should plot the basic sequence of your objects and their movements in some fashion before your proceed. It will save you production time in the long run. You can do your storyboards as hand drawings, or you can even use a paint program like ***Electronic Arts***' **DeluxePaint IV** to sketch out the storyline.

Often as you jot down elements of your story, you will see in advance that certain things you thought would work are physically impossible (like having two objects pass through each other when you actually wanted to have them collide). Or, you may discover that other things you wanted to try will take more work than they are worth. Storyboards are also useful in helping clients to visualize their ideas (which often leads to revisions on their part) before you have gone to the trouble of producing a full animation.

A storyboard will assist you in matching your action with the feeling you wish to create in the viewer. For example, if you want the animation to be very exciting, you may need to speed up the movement of your objects. With, say, a flying logo, however, you do not want ►



to fly it in and out so fast that the viewer cannot recognize it.

Good storyboarding will also help you manage and coordinate for maximum effect the wide variety of motion elements you have at your disposal—object movement, camera movement, placement and variation of lights, surface changes in objects, and so on. If you combine too many changes in these elements, you can easily overwhelm the viewer and defeat the purpose.

Natural Rhythm

Understanding the subtleties of natural motion is another key consideration in creating good 3-D animation. Movement should be smooth and realistic, not jerky and artificial. One of the main reasons that some computer animations seem to jerk is because of "specific placement." While animations may also be jerky because of too much motion in too few frames, or because of slow playback time, specific placement is often the major culprit.

> A storyboard will assist you in matching your action with the feeling you wish to create in the viewer.

By specific placement, I mean that all the objects in each frame are rendered in perfect clarity. However, when you are shooting film or video of real subjects, the media moves at specific frame rates (24 fps and 30 fps, respectively), recording whatever is on the other side of the lens. If the subject is moving faster than the shutter, then a single frame of film/video will contain a blurred image with streaks trailing off in a direction opposite to that of the movement. This phenomenon, called motion blur, tends to smooth out the motion of fast-moving objects.

Motion blur can be simulated with image-processing packages to serve as an effective technique for creating smoother, more realistic animations. This requires more work and possibly more rendering on your part, but it can add significantly to the quality of your animations. The logo sequence in the illustration opening this article is an example of motion blur.

The easiest way to create motion blur is to use a program, such as ***Black Belt Systems*' Imagemaster**, that has its own Motion Blur special effect. You can specify the direction and the extent of the effect and then use the processed frames as interim frames between the actual rendered images to create smooth movement.

Another—and more realistic—method of creating motion blur is to render two or three extra frames between each specific position frame, and then use ***ASDG*'s AD Pro 2** or **Imagemaster** to composite the interim frames. If you have two frames, use a composite mix of 50%; if you have three frames, use 50% for the second and 33% for the third, so that each will have an equal mix in the total. If you have ARexx, you can use scripts that will process an entire series of frames for you.

An additional hint relating to compositing is that you can always add in static backgrounds after the rendering. Most programs allow you to add a backdrop picture, so if you render without the background and add it later, you will save time and gain flexibility. For instance, if a client really likes the logo and the animation movement, but has trouble deciding on a marble or ocean background, you can render the object over a black background in the 3-D program and then composite the frames together once the client has made a decision.

Over and Output

Although output is the final step in the process, it is important to plan during the predesign stage what medium—videotape or film—and what method you will use. As you create your animation, you will be making choices as to colors, resolutions, and so forth that can affect your output options.

Resources are also a major consideration in determining your final output. Some methods may require some pretty expensive equipment. Almost all animations shown on television are single-frame. This means that each frame of the animation is recorded to film or tape one frame at a time. In order to do this, you must have single-frame recording equipment that can guarantee the level of accuracy required. (For information on single-frame recorders, see "Precision Control," 1992 *AmigaWorld Special Issue*, p. 38.)

If you are going to output your animations in true 24-bit color, then you will also need a display buffer that can handle such output. Currently, 24-bit animations must be recorded using the single-frame process.

If you plan to create ANIM files to output your animation in real time on the Amiga, you will have to create IFF-displayable frames prior to creating the ANIMs. Nearly all 3-D programs will do this for you; however, I recommend that you render the frames in 24-bit and use an image-processing program to create IFF-displayable images. Without exception, the results will be far superior.

Quality 3-D animation work results from good 3-D design principles. If you're willing to apply those principles to every aspect of your project—from planning and creating your objects to executing their movements—then you will have a better chance of achieving a successful 3-D animation. Programs currently available on the Amiga can produce results equal to many of the best professional effects created on high-end animation workstations. There are no limits to where your imagination can take you. ■

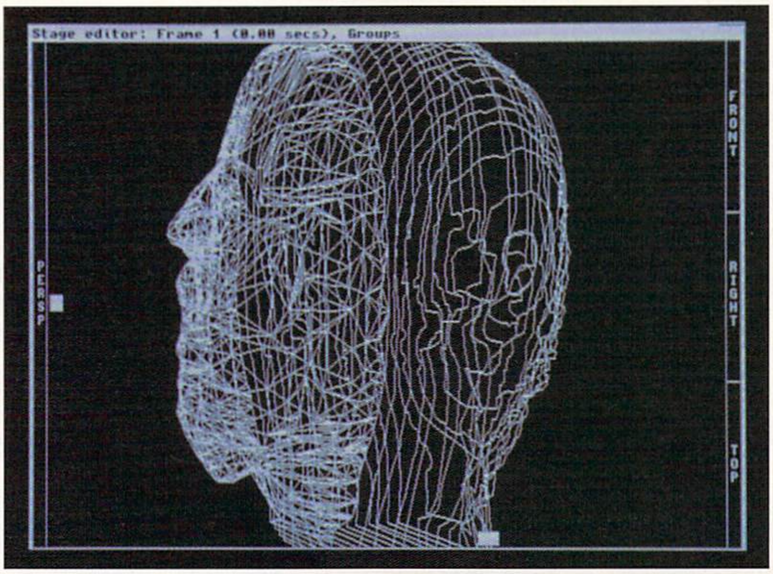
Steven Blaize is owner of Creative Fire, a multimedia-presentation company, and co-owner of the graphics development company, Texture City. He is an author and consultant on Amiga and MS-DOS platforms as well as the assistant director of the Amiga Video-Graphics Guild. Write to him c/o AmigaWorld *Editorial, 80 Elm St., Peterborough, NH 03458.*

3 Dimensionally Yours

You can literally put yourself into your 3-D productions—without spending an arm and a leg. This digitizing-project tutorial shows you how.

Ask Amiga 3-D artists what they want most, and they are likely to request a method for importing real-world 3-D data into their computers. Building photorealistic, complex 3-D models from scratch can be likened to sculpting with air. A technique can easily be visualized, but it is often impossible to do it on a practical level. There are plenty of stock 3-D models available commercially (see "Art in an Instant," p. 30, July '92, for a sampling). But where can you turn when your collection does not contain the precise model you need?

The path to obtaining customized, accurate 3-D point-data models (also known as object-range maps) has multiple branches. If you have plenty of money, you can buy a magnetic or acoustic 3-D rangefinder ($3500 to $13,500) and digitize objects point by point. You can also rent time on a laser-scanning machine at approximately $250 per hour (or buy one at prices ranging from $40K-$80K!), and then convert the output to Amiga format. Another option is to hire a service that offers custom 3-D digitizing. (See the sidebar entitled "Where the Pros Go" for details on these options and their relation to the Amiga.)



For those who have more time than money, I've developed a labor-intensive method for accurately digitizing 3-D point data. It's the least expensive of all the options, and you can use it quite effectively for creating 3-D models of the human face, head, and other body parts. Contained in my method are techniques for obtaining casts that you can use in several other digitizing methods.

Sliced Pumpkin

Most Amiga 3-D modeling and rendering programs support a form of "skinning" cross-sectional data. Imagine a vertical blade making many parallel slices across the width of an airplane wing from leading to trailing edge. These cross sections vary from one to the next as the wing tapers and twists, giving the wing its ultimate configuration. The skin is then wrapped around, completely covering them.

Employing this same design philosophy, you can create 3-D objects from 2-D pieces with the use of your Amiga. When you import cross-section data via a 2-D digitizer or scanner into an Amiga 3-D modeling program, you can reassemble and "skin" them over to create an accurate 3-D model. While taking cross-sectional data directly is very hard on the human head (I don't suggest you attempt it on yourself!), there is a way to get that data without doing yourself any permanent damage. ►

BY KIRBY CARMICHAEL

Although I gave up the Shakespearean stage some years ago, I have since found a use for some of the prosthetic makeup techniques I regularly employed. By combining these with airplane composite-construction techniques, I've found a 3-D data-point digitization method that's easy on the wallet and accurate enough to model a recognizable human head. I'll describe the technique briefly and then delve into the details.

To begin with, you must create a mold of a human head or face, using a substance called **Moulage** (manufactured by ***Douglas & Sturgess***). You then remove the mold and pour into it either liquid foam or a wax-based substance called **Posmoulage** (also from Douglas & Sturgess). When the foam or Posmoulage sets, strip the female mold from the cast head and mount the cast in front of a video camera hooked up to a digitizer, such as **DCTV** (***Digital Creations***) or **DigiView** (***NewTek***). *(To locate the vendors of the products mentioned, see the "Manufacturers'/Distributors' Addresses" list on p. 117.)*

If you have used Posmoulage, backlight the head so that the flat cross sections are noticeably darker than the rest of the head. Use a hot wire to slice off a thin sheet parallel to the lens of your video camera. Move the head toward the camera the thickness of the slice, and repeat.

If you have created a foam cast, spray it lightly with dark paint to contrast with the foam. Use a camper's ring saw or a piece of bandsaw mounted in a rectangular frame to slice cross sections. (Do *not* use a hot wire on foam; burning foam releases hydrocyanic gases!)

Digitize each slice of your cast and use the line-art or edge-detection feature of your image-processing program to extract the cross-sectional data from each image. Then, import the cross sections into a 3-D modeling program via software such as **Pixel 3D** (***Axiom Software***) or the Convert IFF/ILBM function in the Detail editor of **Imagine** (***Impulse***).

Assemble your cross sections in the 3-D modeling program by "stacking" them, separated by appropriate distances. Then, either skin the cross-sections over or construct polygons amongst them. Your result is a wire-frame model of your subject's head, ready for the detail work of adding textures, colors, animation, and rendering.

Project Specifics

Moulage is a nontoxic, reusable gelatinous material that becomes liquid when heated in a double boiler. In its liquid state, it can be poured over the face, becoming, when cool, a firm and rubbery mold. You can insert rubber tubes or straws into your subject's nostrils to facilitate breathing, but it is actually quite easy to leave nostril openings when applying the Moulage by hand. The process is quite simple and is adequately explained in detail in the instructions that come with the product.

Having your face molded in Moulage is a very pleasant experience unless you're claustrophobic. It's quite a bit like getting a facial—all warm and relaxing and quiet. I've actually had subjects fall asleep while I applied it.

Having your entire head, as opposed to only your face, encased in a Moulage mask can bring on throat-constricting fantasies of suffocation. Ask my wife, Carol, who was kind enough to pose for the accompanying pictures. She has instructed me to inform you that you should keep talking to your subject throughout the process, especially in the latter stages.

Unless you already have a proportional 3-D model of a head from which you can cut and paste, I suggest you do mold the entire head the first time you try this process. After the first time, you may find it easier to make a mold of just the face and ears, and then model the rest of the head with your 3-D software. Without a reference, though, it is extremely difficult to position the crown and jaw.

For either type of cast, laminating wire screening into the Moulage before it sets ensures a mold stiff enough for the next step. An alternative I use is to lay plaster-cast bandages—cut in short strips and soaked in warm water—over the Moulage. The supportive bandages—actually rolls of gauze that have been impregnated with plaster of paris—set up very quickly.

If you are molding an entire head in one piece, you'll have to slice the mold once to remove it from your subject's head. The material slices like butter, so use a dull blade. (This is one time when it is important to talk to your subject. The feel of the knife on the tip of Carol's ear at this stage so startled her that she nearly suffered a Van Gogh handicap.)

The Moulage mold releases quite easily when you gently pull upon it. If your subject's hair is embedded in it, however, the situation can become a bit, well, hairy. Mustaches are not really a problem, but I suggest slicking back facial hair with petroleum jelly. I covered Carol's hair with kitchen cellophane before applying the Moulage. Once you've removed it, you must paste the head mold back together with Moulage, or, if you're using plaster bandages for reinforcement, with short strips of bandage.

Next, you must cast the head. Douglas & Sturgess has expertise in pourable forms and the use of a hot wire. The company's Posmoulage is a wax-based substance that picks up subtle details in the Moulage.

Rigid Foam 25R is the firm's two-component, liquid system for producing rigid polyurethane foam suitable for casting. Another foam-casting material is ***Tap Plas-***







tics' **X-40**. While it provides for smooth surfaces, X-40 does not produce uniformly small air bubbles, so you'll need to clean up the resulting cross-sections and may not get the kind of detail other foams offer. With either foam, four ounces each of Parts A and B produce more than enough for a full head cast.

Mix the two parts of either system according to the manufacturer's instructions, then pour the foam into the Moulage mold. Be aware that any water on the Moulage will affect the casting. It will show on the Posmoulage head and will actually affect the curing of the foam. ►

WHERE THE PROS GO



The face of Fred Mack: Cyberware digitized, Imagine rendered.

DAVID SMOOT, A Hollywood director and a manager at the Sony Video Institute, recently said to me, "Terminator 2 is the standard by which your videos are judged." He didn't qualify that statement by limiting it to professional videos, either.

Since your 3-D animations dumped to video will be judged by those standards, why not use the same equipment and techniques the T2 team used to create those outstanding special effects? I'll describe the high-end digitizing units available, and then tell you about a couple of companies that make them accessible to Amiga users.

Digitizing Hardware

Cyberware manufactures optical 3-D digitizers (around $50K–80K) that have been used to create effects for movies such as *T2*, *Batman Returns*, and *The Abyss*. They take 3-D point data via laser rangefinding, resulting in surface geometry files containing about 256,000 vertices, and also digitize surface color data at the same time to produce 24-bit color texture maps to a resolution of 512×512.

Cyberware models **3030 MS** and **3030 PS** digitize 3-D surface data at the rate of 15,000 points per second and a typical resolution of one point per millimeter (maximum resolution is five points per millimeter). Both use a "cylindrical scan" system so that they can take front, back, and side data.

Polhemus, a company well-known in the virtual-reality industry, makes a magnetic rangefinding 3-D digitizer consisting of a black box and a probe. To digitize, you manually select data points. (For feasible scanning of a living subject, you must make a cast.) Although selecting several thousand data points by hand can be tedious, the Polhemus device offers resolution equaled by no other digitizer.

Science Accessories manufactures a 3-D digitizer based on time-of-flight sound rangefinding. Named the **GP8 Three-Dimensional Sonic Digitizer**, it is suitable for digitizing the contents of up to a nine-foot cube.

The unit consists of two black boxes and eight sparkplug-like emitters, as well as four microphones set square to each other on the XY-plane and a ten-foot cable tipped with a probe. The probe must be placed on each point to be digitized, and it must be on a clear line of sight from at least two microphones. Software computes the XYZ coordinates to a resolution of .01 cm.

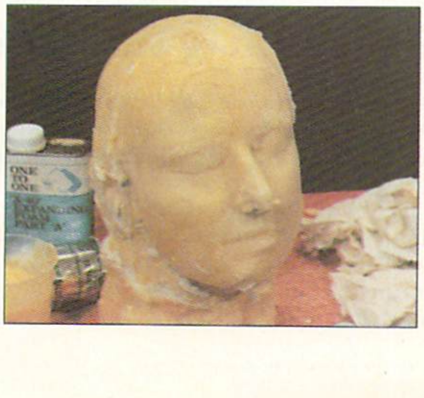
Viewpoint, a custom 3-D digitizing firm, has extensive experience on most optical, magnetic-resonance, and sonic-digitizing hardware. Viewpoint has Science Accessories and Polhemus units, and access to a Cyberware unit. The firm has also developed a portable optical digitizer that does not have the object-size limitations of other systems and has an accuracy of about one-tenth of an inch. Viewpoint personnel travel extensively with this setup, often using it to digitize cars and airplanes on a custom basis.

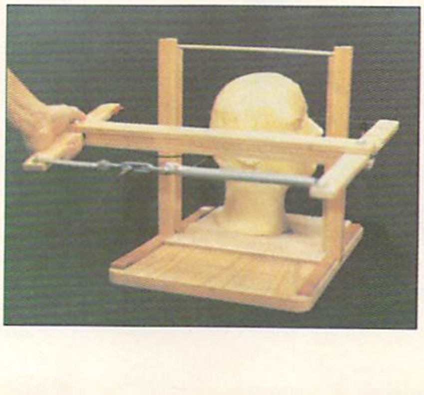
Viewpoint can keep custom digitizing priced relatively low because of the resale value of the digitized objects. The company has an extensive library of 3-D objects (running about $200-$500 each) and will sell packages composed of any of them in any format the customer requests. In addition, Viewpoint sells prepackaged objects in the 3-D Studio and Topaz formats. (Company reps were also seen talking to Allen Hastings of LightWave and Videoscape 3D fame at SIGGRAPH this year.) A call to Viewpoint will net you a comprehensive catalog detailing goods, services, and pricing.

Amiga-Bound

DuBois Animation offers a version of **Animatrix Modeler** that contains a module allowing the direct use of a Polhemus device. To enter a point in Animatrix Modeler, you simply place the digitizer's stylus on the object and press the Amiga's space bar. With the newest Polhemus digitizer starting at about $3500, this avenue is within the reach of many professionals.

Fred Mack, a Bay Area animator and programmer, uses Cyberware's equipment on a regular basis and has written his own utility to convert raw Cyberware data into data directly acceptable by Imagine. The accompanying image, which is in fact Mack's own face, was created in this way—and rendered in Imagine. (He has also used his Amiga to create animation for Cyberware's SIGGRAPH display.) Mack is available for custom digitizing of real 3-D objects and conversion to both Amiga and PC formats. —*K.C.* □





The molding and casting process illustrated. The screen capture on the opening page shows the result in wire-frame format.

When the cast has set, remove the mold, and you'll have an accurate reproduction of your subject's head or face. You'll quite likely destroy the Moulage mold in removing it. The Moulage is reusable, however, so this is not a continuing expense.

PERFECT PIECES

The slicing device consists of an H-shaped frame across which you place either a hot wire (stainless-steel wire attached to a piece of zip cord and a dimmer switch) or a ring saw (wire with embedded abrasive), depending on the cast material. The hot wire slices the wax-based Posmoulage; the ring saw slices foam. See Figure 1 for details of how to build the device.

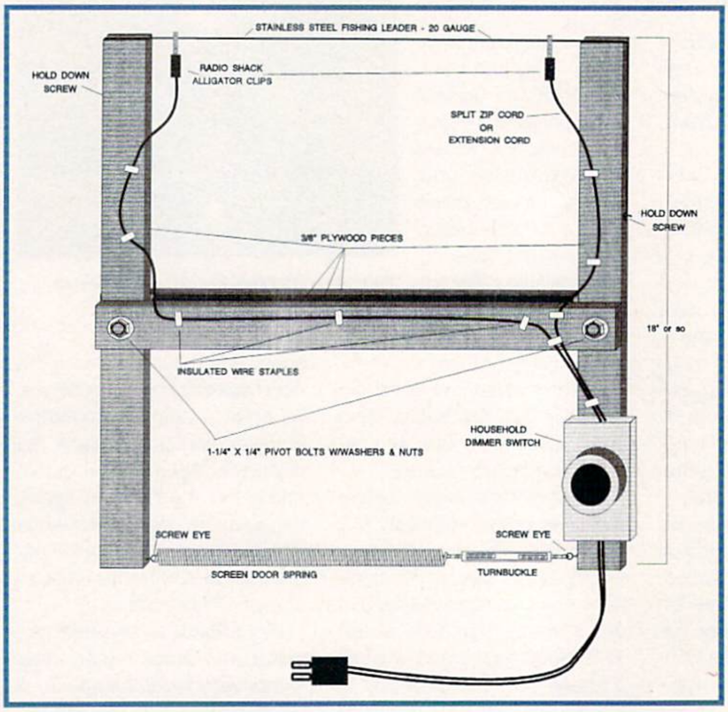


Figure 1: Diagram of the cutting device. A hot wire is indicated here; for use with a foam cast, simply stretch a ring saw across the frame instead of the stainless-steel wire.

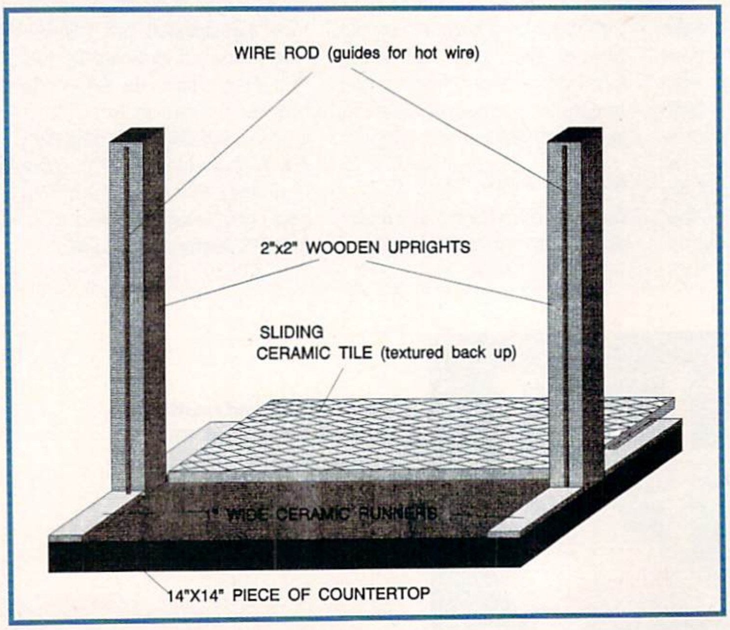


Figure 2: Jig detail.

It is essential to keep the wire taut while slicing; sagging wire will not produce parallel cross sections. Placing a spring at the end of the wooden H-frame opposite the wire helps.

For hot-wire slicing, plug the dimmer switch into a wall socket and adjust it to heat the stainless steel. The wire is not hot enough when it will not cut smoothly, and is too hot when it starts to glow red or sag.

To accurately slice your cast into cross sections, you need some way to solidly position it so that you can move it a predetermined amount between slices. Because the "blade" works best when it is pulled down a parallel set of runners (thus assuring a plane that is always parallel to the camera lens), you must be able to move the table mount for the cast between the runners after each slice is made. An upside-down piece of ceramic tile works fine. It has parallel edges, and its textured bottom provides a good surface upon which to solidly epoxy the head.

Examine the drawing of the jig I've constructed to serve these purposes (Figure 2). Once you have sliced off a piece, move the table forward the thickness of your next slice and digitize the surface. A metalworker's scale epoxied onto the side of the jig allows you to accurately move the table a specified amount. As long as you move the table the same distance every slice, the scale of the cross sections will remain constant.

I used DCTV and a camcorder to digitize each cross-section. As always, the more careful you are in setting up your lights, the better will be the picture you produce. And the better the picture, the easier it will be for your image-processing program to extract a clear cross-sectional outline using its edge-detection or line-art function. I suggest that you light the background with fill lights. With two back lights, the limited contrast ratio available with video will ensure that the cut plane remains dark while the background is very light.

Pixel 3D is my program of choice for converting the IFF outlines into a suitable 3-D object. The ins and outs of your particular 3-D modeling program are up to you.

Excluding camera, computer equipment and software, the total cost of materials for this project is around $75 (see the "Parts and Prices" box for specific breakdowns). Of course, your time is a bigger investment, but your results will be truly rewarding—and truly unique.

FUTURE FORMS

On the horizon is an alternative method for creating 3-D models that's still within the reach of most Amiga users. It will require about the same amount of time as the method I have presented, but employs an altogether different process.

Coming from ***duBois Animation*** (creator of the Animatrix 3-D modeler) is an option in the form of a program tentatively titled **Animatrix Digitizer**. This program requires a digitizing or drawing tablet and a still camera for high-resolution digitizing. The software is based on simple trigonometry and allows for higher-resolution work than many other methods. With it, you can translate any size static or dynamic object into 3-D digital-point data. ►

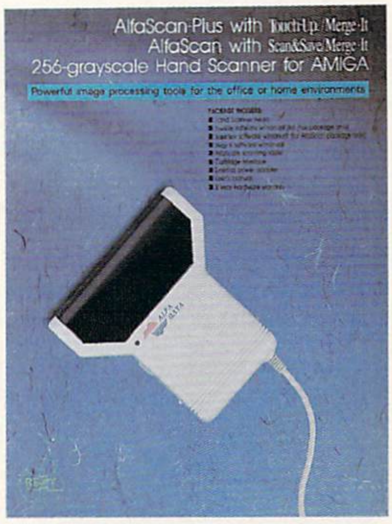


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The method is simple; I first read about it in *Synthetic Actors in Computer-Generated 3D Films*, by Thalmann & Thalmann (1990, ***Springer-Verlag***). You begin by painting or marking enough points on an inanimate object, model, or cast of an object to establish the needed resolution, and then numbering each point clearly. You then mount the object or model on a turntable (a lazy Susan works well), set up a still camera containing fine-grain film, and take a picture of the object. (The still camera must be close enough that the number for each point will be visible on the resulting photo.) Rotating the object up to 60 degrees, you then take another picture, making sure both pictures contain all the points you want to digitize in one view of the object.

Once you've developed them, mount the two pictures on a digitizing tablet and enter the individual point pairs into Animatrix Digitizer using the tablet's pen. The program uses trigonometry operating from the rotation angle of the object for each picture to compare the different picture locations of the point pairs. It then assigns each point a position in 3-D space. You may have to repeat this procedure three or four times and merge the resulting objects to create a 360-degree model.

All this goes to show that photorealistic 3-D images and animations are within the creative realm of all Amiga artists, whether more wealthy in money or in time. ■

Kirby Carmichael is a principal of BuzzWord MultiMedia, a west-coast multimedia consulting, animation, and video studio. Write to him at 411 Heathcliff Dr., Pacifica, CA 94044.

PARTS AND PRICES

Plywood (3/8×18×18 inches). It runs about $2 at any lumberyard, but you've probably got it lying around somewhere.

Countertop cutout. This material is very flat, much more so than standard plywood, and you can probably get it for free from a lumberyard that cuts countertops. The lumberyard makes the cutout to install a sink, and routinely discards the cutout material.

Wood glue. A small bottle cost me $1.55 at a hardware store.

Ring saw or fishing leader wire. The former is available for $5.89 at a camping store. 20-gauge stainless-steel fishing leader wire costs about $2 from a bait shop or discount store. Either will serve as your "blade," depending on your casting method.

Wire rod. One 36-inch piece costs about 89c and is available at any hardware store. Cut in two and glued onto the uprights,it will serve as runners to guide the cutting wire.

Mini alligator clips (2). I recommend Radio Shack's Cat. No. 270-372A; they are $1.89 each. With the hot-wire method, standard alligator clips weaken the "blade" at the point of contact because electrolysis occurs between the two metals under current. This causes the hot stainless-steel wire eventually to break under tension—and possibly fly back and hit you in the face. Because Radio Shack's clips feature a round curve in the contact area, they are much less likely to break the hot wire.

Turnbuckle. The turnbuckle allows you to achieve proper cutting-wire tension. It costs $1.80 at hardware stores.

Spring. Cost: about 50c at a hardware store.

Nails (3). Negligible cost.

Ceramic tile. Tile with a hexagonal back that absorbs tile cement costs $3 or $4 at your local tile store.

Runner tile. Four pieces of ceramic runner tile for the jig runners costs about 50c each at a tile store.

Tile adhesive. About $3.

Moulage. Douglas & Sturgess is the manufacturer of Moulage, and to my knowledge, its only source. It runs $25 for five pounds.

Plastic screen wire or **plaster-cast bandages.** Depending on the method you use to reinforce the mold, obtain the former from a hardware store or the latter from a medical-supply house or pharmacy. Wettable plaster bandages cost about $4.50 for a 4-inch roll.

Posmoulage or pourable foam. Depending on the method you use for casting, Posmoulage is available from Douglas & Sturgess at $30 for 10 lbs. You can get foam in one-quart kits from Douglas & Sturgess ($18) or Tap Plastics ($12.80) to make 1¼ cubic feet.

Zip cord. This is for the Posmoulage/hot-wire approach only. Buy ten feet at your local hardware store for about 20c a foot, or butcher a $3 extension cord.

Rheostat or **household dimmer.** This is for hot-wire method only. The household dimmer switch works very well because it can be attached directly to the hot-wire frame. Buy one at any hardware store for $10, or cannibalize your game room dimmer switch (only *after* you've opened the appropriate circuit breaker!). □

THE AREXX INTERVIEW



An AW correspondent pumps his subject for answers to ten common questions about ARexx.

#1 ***AmigaWorld:*** *What the heck is ARexx, and why would I need it, anyway?*

ARexx: ARexx is a language—like BASIC or C or Pascal—that is used to write programs that control your computer. The programs are simple text files, editable by any text editor or word processor, which are then "interpreted" in real time as they are run. The Amiga version of the REXX language is a commercial product sold (and programmed) by William S. Hawes. Commodore is including ARexx free with the 2.04 and later releases of the operating system. If you buy it separately, it sells in the mail-order houses for less than $30, and (in my humble opinion) is well worth the money.

Let me try to give you the short answer on why you need it.

• First of all, it replaces the AmigaDOS script language. ARexx can do everything AmigaDOS can do (in fact, it can even use AmigaDOS to do it), and it is at least as easy to work with, but much more flexible and powerful.

• It replaces BASIC for those little "I've got a job to do, and I want it programmed quick" kind of problems, and through the use of external libraries it can take over for most of the "bigger" tasks you might previously have done using BASIC.

• It acts as a go-between to let other programs exchange information—program A sending data through ARexx to program B, and maybe back again. This interprocess communication makes possible the automation of all sorts of things, and it will become more and more useful and important as more and more programs become "ARexx-compatible."

#2 ***AW:*** *"Function Not Found!" errors! Explain this library business, okay?*

AR: This can be a confusing area. Some libraries come with ►

BY RICHARD STOCKTON

ILLUSTRATED BY GWYN STRAMLER



The best advice I can give you for adding new libraries is "read the docs" for each one.

ARexx, some don't. Some should be loaded by you, and some definitely should not. ARexx comes with two libraries standard: the rexxsyslib.library and the rexxsupport.library. The first is loaded automatically by the "rexxmast" program that runs in your startup-sequence, but the support lib needs to be loaded by you before the functions in it can be called by ARexx. Functions in the rexxsupport.library include SHOWDIR(), SHOWLIST(), STATEF(), OPENPORT(), CLOSEPORT(), and the message-handling routines like WAITPKT() and GETPKT().

As you can see, there is a lot of good stuff in there, so this library is often needed. The mere fact that it exists in libs: is not enough; you have to tell ARexx that you want to make it available for use. You can do this in your startup-sequence by adding a line such as

```
rx "CALL ADDLIB('rexxsupport.library',0,-30,0)"

*** DO NOT load the 'rexxsyslib.library'! ***
```

Among the freely distributable ARexx-compatible libraries, the rexxarplib.library, written by Willy Langeveld, is probably the most widely used. It adds screens, windows, gadgets, and graphics to the ARexx arsenal of commands. This is how you can quickly get a nice Graphic User Inferface up and running with a minimum of fuss.

If you use the rexxarplib (and lots of demo programs do), the rexxarplib.library (and possibly the rexxmathlib.library) needs to be loaded, but the arp.library and the screenshare.library, although required for the rexxarplib to work, should not be loaded. (They are loaded automatically when needed.) To accomplish this, add the following:

```
rx "CALL ADDLIB('rexxmathlib.library',0,-30,0)"
rx "CALL ADDLIB('rexxarplib.library',0,-30,0)"

*** DO NOT load the 'arp.library' or the 'screenshare.library'! ***
```

There are other ARexx-compatible libraries available, which brings up one of the most powerful features of ARexx: its ability to access commands from libraries or even other running programs. The best advice I can give you for adding new libraries is "read the docs" for each one. The author should tell you if it needs to be loaded and, if you're lucky, include an example of the preferred method.

#3 ***AW:*** *How can I find out if my script is being used with the new 2.0 OS?*

AR: Try out the following routine:

```
a = SHOWLIST('L','exec.library',,'A')      /* get library address */

b = OFFSET(a,20)                            /* add 20 to address */

c = IMPORT(b,2)                  /* get 2 chars from that address */

d = C2D(c)              /* and turn them into a decimal number */

IF d >= 37 THEN SAY 'WorkBench 2.x version V'd
ELSE SAY 'WorkBench 1.3 (or less) version V'd
```

#4 ***AW:*** *I've heard you say that routines could be written that would somehow "TRAP" errors, and show me the offending code. Show me!*

AR: The followimg will automatically display the line in your code that ARexx is having a problem with, as well as the lines on either side of the probable error line. The internal ARexx "Special" variable RC will hold the error number and SIGL will hold the line number where the signal occurred. First, turn on the required feature by putting this line near the top of your ARexx program:

```
SIGNAL ON SYNTAX
```

Then, at the bottom of your program add:

```
EXIT      /* we don't want to accidentally execute this routine */
SYNTAX:
          /* ":" denotes a "label", can be CALLed or SIGNALed */
SAY 'SYNTAX ERROR:' RC ERRORTEXT(RC)
                                  /* built-in English messages */
SAY SOURCELINE(SIGL-1)
SAY SOURCELINE(SIGL)
                           /* <<== this line SHOULD be the error */
SAY SOURCELINE(SIGL+1)
EXIT
```

If you replace the EXIT with RETURN, it will force the program to continue from the point of the error. This is dangerous in most circumstances, because you don't know what the syntax error might have been. There could be times when all you want to do is trap the signal (if the user presses BREAK_C, for example), so that the program can exit gracefully, saving data, and so forth. In that case, you might have the BREAK_C: routine RETURN rather than EXIT.

SIGNAL ON SYNTAX is usually the most valuable debugging tool, but you can "SIGNAL ON" a whole variety of conditions including BREAK_C thru BREAK_F, ERROR, FAILURE, HALT, IOERR, and NOVALUE.

#5 ***AW:*** *How do you change the current directory "inside" an ARexx program?*

AR: It's easy—simply use the following:

```
old_dir = PRAGMA('D',new_dir)
```

All internal ARexx commands, like OPEN(), RENAME(), DELETE(), and so on, will now be pointed at new_dir as their current directory.

If you are using ADDRESS COMMAND to launch a CLI-based program, however, it is a bit trickier, since the Shell or CLI that ADDRESS COMMAND uses may or may not know the current directory, depending on your environment. The safest thing to do, the thing that works every time in any ARexx environment, is to set the directory as the first command and connect it to the commands that follow, using the linefeed character, ASCII character 10, hex 0A. In this way, all of these commands will be executed as if they had been typed, one line per linefeed character, at a single CLI window. Note that ADDRESS COMMAND sends the final linefeed automatically.

You can put an implicit "CD" into the ADDRESS COMMAND by doing this:

```
LF = '0A'x
ADDRESS COMMAND 'CD DF0:' LF 'DIR' LF 'CD RAM:' LF 'DIR'
```

This will display a directory listing of DF0: and then one of RAM:

#6 ***AW:*** *How can one send a text string directly to the printer? In BASIC, you'd simply LPRINT "Hello World." How would you do it in ARexx?*

AR: Well, here are three ways. First, you could simply enter

```
ADDRESS COMMAND 'Type >PRT: Hello World'
```

but that method is somewhat limiting, and is slow if you need to send more than a single line of text. Here's what I normally do:

```
x = OPEN(p,'PRT:','W')     /* using the printer as if it were a file */
IF x == 0 THEN EXIT 20
CALL WRITELN(p,'Hello World')                  /* write one line */
CALL CLOSE(p)  /* close the printer so the next task can use it */
```

Or, if you put your text into a stem (let's call it "text.") and keep the total number of lines in text.0, you can use this more general routine:

```
text. = ''                          /* blank our sample text file */
text.0 = 3                                        /* just 3 lines */
text.1 = 'This is line 1'
text.2 = 'line 2'
text.3 = 'now is the time for all good men to...'

x = OPEN(p,'PRT:','W')
IF x == 0 THEN EXIT 20
DO i = 1 TO text.0
  CALL WRITELN(p,text.i)
END
CALL CLOSE(p)
```

Remember that WRITELN() appends a linefeed character (ASCII 10) to the text sent automatically, but WRITECH() (not used here) does not.

#7 ***AW:*** *I need to format commas into numbers like 980432009 to make them more readable. Is there a command to do this?*

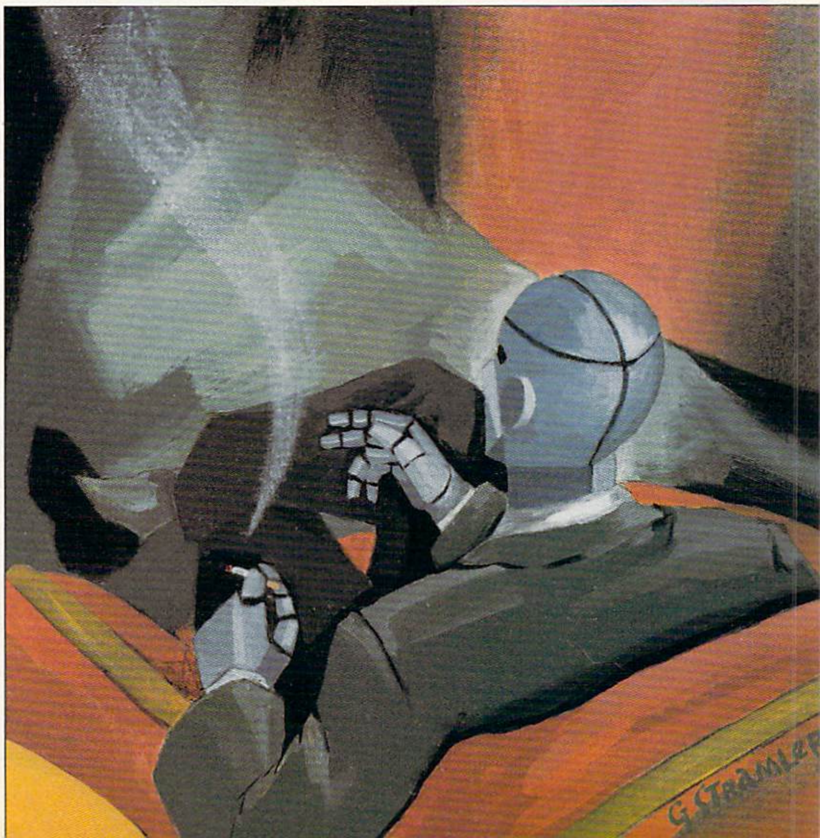
AR: ARexx does not have a built-in command to do this, but here is a subroutine you can use that will handle up to 15 digits—large enough to show the national debt! It also remembers any digits to the right of the decimal point, passing them back unchanged.

```
comma: NUMERIC DIGITS 14
               /* largest number of digits ARexx can handle */
ARG num .
mant = num - num%1
               /* anything to the right of the decimal point?*/
IF mant = 0 THEN mant = ''
ELSE
  DO
    mant = SUBSTR(mant,2)
                          /* if yes, then remove leading "0" */
    num = num % 1              /* make num into an integer */
  END
dgt = LENGTH(num)                /* number of digits in num */
numtext = ''
IF dgt>3 THEN numtext = ','RIGHT(num,3)
IF dgt>6 THEN numtext = ','LEFT(RIGHT(num,6),3)||numtext
IF dgt>9 THEN numtext = ','LEFT(RIGHT(num,9),3)||numtext
IF dgt>12 THEN
  DO
    numtext= ','LEFT(RIGHT(num,12),3)||numtext
    numtext = LEFT(num,dgt-12)||numtext
  END
ELSE IF dgt>9 THEN numtext = LEFT(num,dgt-9)||numtext
ELSE IF dgt>6 THEN numtext = LEFT(num,dgt-6)||numtext
ELSE IF dgt>3 THEN numtext = LEFT(num,dgt-3)||numtext
ELSE numtext = num numtext = numtext||mant
                          /* replace any decimal point data */

RETURN(numtext)
```

#8 ***AW:*** *Could you give me an example of a way to wait for a disk to be inserted into a certain drive and then report the volume name of the disk that was inserted—with no action* ►

...but a subroutine ... will handle up to 15 digits—large enough to show the national debt!



performed on the part of the user except to insert the disk?

AR: Let's say the "certain" drive is DF0:. Now try this:

```
CALL PRAGMA('W','N')                    /* turn off disk requesters */
DO loop = 1
  IF EXISTS('DF0:') THEN
    DO
      olddir = PRAGMA('D','DF0:')
                                    /* make df0: the current directory */
      SAY 'The disk in DF0: is called' PRAGMA('D')
      LEAVE loop
    END
  CALL DELAY(100)                                   /* wait 2 seconds */
END
```

This will tell you the name of the disk in DF0: If there is no disk in the drive, it will keep checking every two seconds until a disk is inserted.

#9 ***AW:*** *Are there any good REXX books specific to the Amiga?*

AR: *Using ARexx on the Amiga,* by Chris Zamara and Nick Sullivan (Abacus, 425pp., $34.95), includes a disk with examples. It covers all areas of ARexx well and assumes nothing about your programming knowledge. Included are numerous examples of using ARexx with programs. This is ARexx from the end user's viewpoint.

Amiga Programmer's Guide to ARexx, by Eric Giguere (Commodore, 218 pp., $20), also includes a disk with examples. This one, however, covers ARexx from the programmer's viewpoint: How to put an ARexx port in your program, standard commands, and so forth. At the moment, this book is available only from CATS (Commodore Applications & Technical Support). To order, write to: Commodore Business Machines, Department C, 1600 Wilson Drive, West Chester, PA 19380. Specify CATS Part Number: AREXX01 and add $3 for shipping and handling. CATS insists on check or money order—no plastic. Add sales tax if you live in Pennsylvania, Virginia, California, Tennessee, or Illinois.

#10 ***AW:*** *Where can I get answers to my ARexx questions?*

AR: I run an ARexx question-and-answer session on the first Saturday of every month at 6 PM PST on Portal (408/973-9111 to sign up). You can also leave electronic mail for me on Portal, BIX, or GEnie (I am rlstockton on all of these). I also run my own BBS at 206/744-1254. If you are among the modem-impaired, you can mail me your questions care of *AmigaWorld*, and I'll try to help.

Bill Hawes, the author of ARexx, is also available on BIX (whawes), where he moderates a public message conference (amiga.vendors/wishful) for support of his products. If I can't answer a question, this is where I usually turn for the "ultimate" answer. ■

Richard Stockton is one of the leading ARexx programmers in the country and a cofounder of Gramma Software, a publisher of ARexx-compatible software.



Audio For Video

In the first installment of a two-part series on the audio portion of video production, we consider some techniques for achieving good recording results.

By Michael Hanish

WHEN THE AUDIO portion of your video is flawed, your entire presentation suffers. A dialog-intensive instructional tape I saw recently exemplified this fact. It was so poorly miked that the speech was nearly unintelligible, and, to add insult to injury, jarringly loud, throbbing disco music separated segments.

While we are most conscious of the information we take in visually, our audio sense is at least as discriminating (if not more so) to inconsistencies and discrepancies between visual and aural elements. In fact, we readily take for granted the subtle and vast amount of audio information that surrounds us. In spite of the best intentions, the audio tracks of a video may impart a totally different effect than was initially intended.

The following two Video Suite installments will look at both the technical and aesthetic elements of preparing and editing audio tracks (including sound, dialog, and music) for video. This discussion will touch only the tip of the iceberg, however. You can find more help in books and other articles (see a recommended bibliography in the "Sound Advice" box on the next page).

Your main source of information, though, will be the work of others. Look and listen for both good and bad, what succeeds and what doesn't, and then apply that same critical distance and sense to your own work. Use whatever you find to work best for you. *(To locate the vendors of products mentioned, see the "Manufacturers'/Distributors' Addresses" list on p. 117.)*

What You Hear and What You Get

As with any other aspect of production, you should have reliable, faithful monitoring so you know the exact signal quality going onto your recording. For audio work, this means using an amplifier and speakers, and headphones as well, if possible. In the studio, you need not listen at high volume (save that, and your hearing, for the dance party), so your amp and speakers need not be tremendously powerful—just accurate. Don't forget to listen to your piece through a television set; it is in that low-fidelity environment that most people will see and hear your work.

Headphones are a good tool for the studio, and an absolute necessity for field recording. It's a waste of time to attempt field recording without using them to monitor your work. If you are doing a location shoot, record several minutes of ambient ("wild") sound and location video; it may come in extremely handy during editing if you need to recreate the feel of the place but are unable to go there again.

Also, make it a habit to record an audio reference tone at the beginning of each tape you create or use. The reference can be any sort of tone of which you know the level (volume); traditionally, it is 0dB, which is clearly marked on all VU (audio level) meters.

This recorded tone is useful for setting reference monitor and record levels in the studio. If, for example, your amplifier is turned way up, you will have a very distorted sense of the level and sound quality that is going to tape. Incidentally, when you have the option, set levels manually rather than rely on your camera's or VCR's automatic level control (ALC). While the ALC does its job well, sometimes it does it too well, boosting out-of-shot sounds in an attempt to keep the overall levels equal.

Ears and Eyes

Microphones are your ears on the world. To use them properly, you need a general understanding of how they work. Very basically, a microphone changes physical sound waves into electrical impulses that can be recorded on tape. Like a pair of eyes, a microphone has a field of "vision" (called the directional pattern) and acuity (referred to as frequency response, or sensitivity).

The three general groups of directional, or polar, patterns are omnidirectional (equal sensitivity to sound coming from all directions), uni-directional (forward direction), and bi-directional (which picks up sounds in front and back, but not the sides). There are numerous pattern variations within each group. The more sensitive a mike is and the greater its frequency response, the better its recording fidelity. And after all, the point is to get an accurate representation of the sound to tape. ►

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There are, to say the least, a number of aesthetic choices involved in using microphones. The "sound picture" your microphone captures will give a tremendous amount of information to your audience. For example, using a single microphone to capture sound and dialog in a room will give the sonic effect of distance from the sound source, even when the camera is recording a close-up shot. If this is the effect you want, fine. It is rarely appropriate, yet it is the technique used most often by inexperienced video makers, usually by default.

All video cameras have an external microphone jack crying out for use. Radio Shack, as a low-end source, has a variety of inexpensive microphones that you can connect there, from lavaliere (which you attach to the speaker's lapel) to shotgun (extremely uni-directional) to PZM (an omni-directional type very useful for picking up a wide field of sound from many sources simultaneously and accurately). As Mr. Natural said, "Get the right tool for the job." The sound you record can be manipulated in post-production—given you have the resources—but it is far better to get it right in the beginning.

Many kinds of microphones exhibit the proximity effect—a boost of the bass frequencies that are recorded—when they are placed close to the sound source. This could be the sound quality you want, but you won't even know what you're capturing unless you monitor. Recording a scene with multiple sound sources is best done with several microphones and a mixer, allowing you (or your sound recordist) control over level, tone, and placement of each source.

Miking and mixing techniques can, for example, bring out specific character traits. In the television series *In the Heat of the Night*, one habit of Rod Steiger's sheriff character is loud and incessant gum chewing, which is recorded with a great deal of presence and mixed loudly with his dialog. By keeping that sound prominent in the final mix, the director is giving us a deep and subliminal insight into the character. The power of sound in video is simultaneously direct and subtle.

The Guts of the Issue

Good sound effects can evoke strong visceral responses from viewers; bad ones may induce unexpected diversionary raids on the kitchen, caused by viewer boredom. While dialog should usually be close-miked and recorded with the video (it is extremely difficult to replace dialog accurately), the natural sounds of an event, as recorded live, generally do not accurately portray it.

Sound effects are usually rerecorded and dubbed in at a later stage in post-production, and in this aspect your Amiga can be particularly helpful. Used with care, any of the eight-bit samplers on the market can do a fine job of recording, editing, and triggering sound effects or even ambient sound tracks back into your audio. You need to use the same care and attention to detail (mike placement, tone, and sound quality) when recording and preparing a sound-effect sample as you do when recording any other audio. (For more information on good sampling techniques, see "Now Hear This," Dec. '90, p. 43.)

It is far easier and more accurate to be able to digitally edit the sound and apply reverb, echo, effects, and equalization (tone control) with software, rather than by cutting, splicing, and rerecording audio tape. The advent of 12- and 16-bit audio for the Amiga—brought on, respectively, by ***SunRize***'s **AD1012** and **AD516** boards—greatly expands the control, quality, and accuracy. But more about that in our next installment.

The task of getting the sounds to hit at the appropriate places in your video (synchronization) can be accomplished in a variety of ways. By far the easiest is to edit all the audio tracks to a multi-track tape recorder "locked" (made to run in sync) to the video edit master, and then to audio-dub the finished full soundtrack (sound, dialog, and music) to the edit master.

As an alternative, you can add them on the fly, along with music, as an audio dub between two VCRs. Run the audio output of the source VCR (containing dialog and ambience) into one or two channels of a mixer, add the music source (MIDI, tape, sampler) and the Amiga's audio out and/or sampler output to other channels, and send the output to your recording VCR.

At the appropriate times, you can trigger samples manually, by ARexx script, from a sequencer (particularly ***The Blue Ribbon SoundWorks***' **Bars and Pipes Professional**), or from one of the many multimedia authoring or presentation programs. (We'll discuss this process next month. In the meantime, see "Amiga Talkies," 1992 *AmigaWorld Special Issue*, p. 58, for more information.)

You need not break the bank or your back to get good-quality, effective audio for your video. Trial and error and extreme attention to detail are required, however—even if you use the best and most extensive equipment.

Come on back next month, when we consider the "heart" of the matter—music—and the often mind-bending task of putting it all together. ■

Sound Advice

CERTAINLY THERE IS much more to producing good audio for your video presentation than can be adequately covered in a two-part article. A number of excellent books are available on the subject. The following are my recommendations.

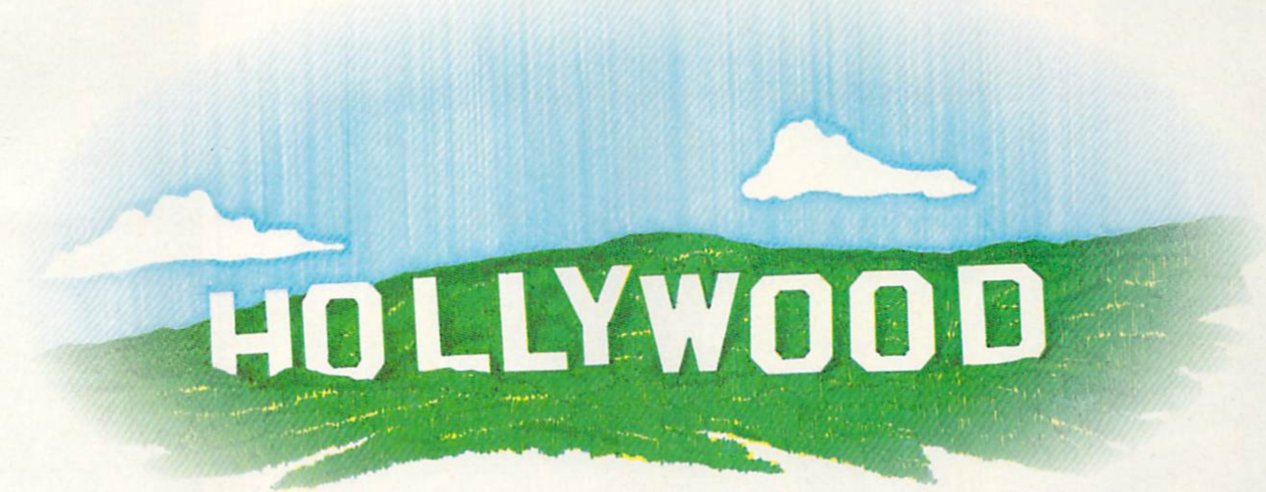
Introduction to Professional Recording Techniques, by Bruce Bartlett (1987, Howard W. Sams), offers detailed information on everything for audio, including mike techniques and types, MIDI, location recording, sound effects, and sound quality, as well as SMPTE and syncing sound to video.

While Gerald Millerson's *Video Production Handbook* (1988, Focal Press) covers primarily video production, it also contains excellent information on audio as it relates to the whole.

Finally, *Sight, Sound, Motion: Applied Media Aesthetics*, by Herbert Zettl (1990, Wadsworth Publishing), is just what its title suggests. It demonstrates the effects that sound, imagery, and both of them in conjunction have on the viewer, so that you can produce the results you intend. □

Michael Hanish uses an Amiga for video, graphics, and music with both his performance group and his adult literacy students. He writes frequently on audio and video topics. Write to him c/o AmigaWorld Editorial, 80 Elm St., Peterborough, NH 03458.

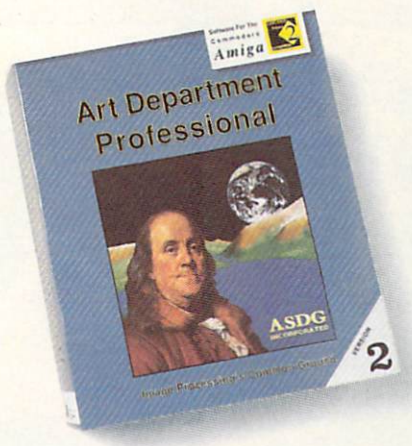
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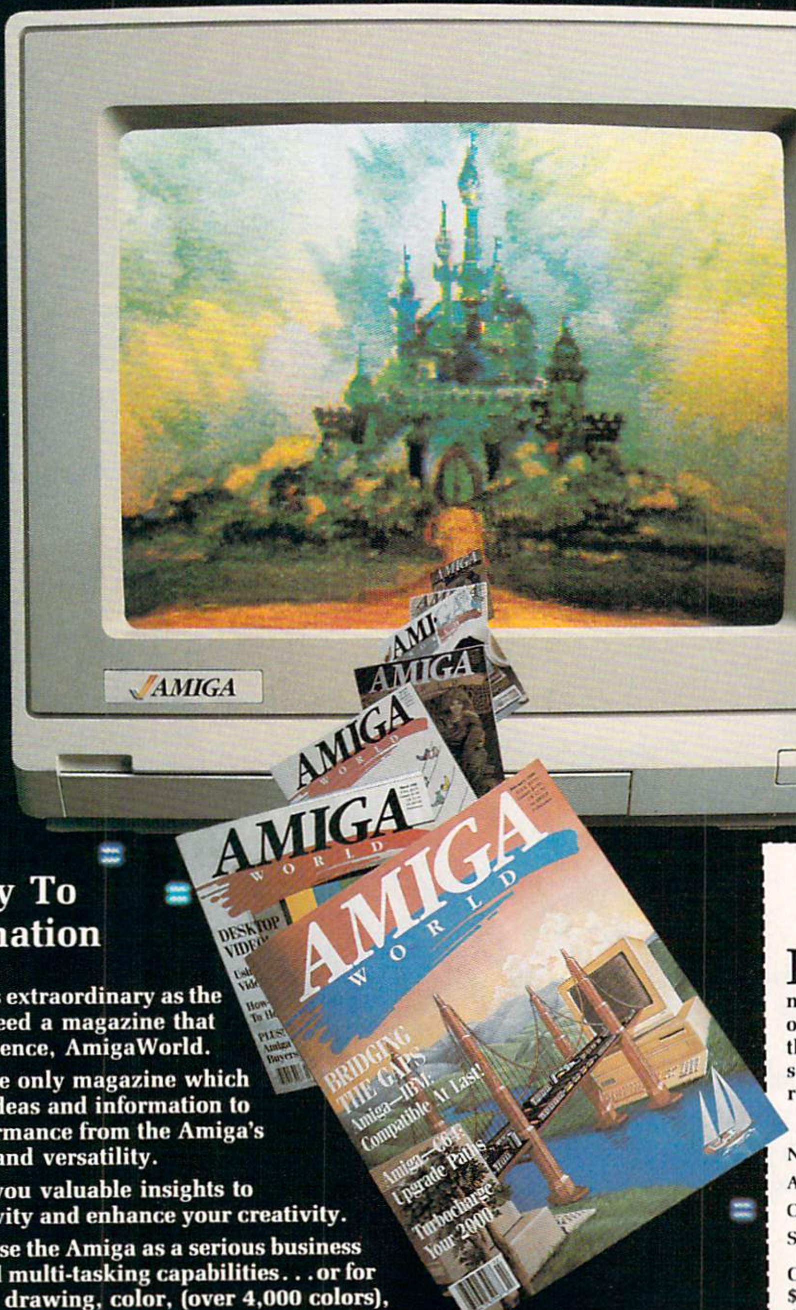
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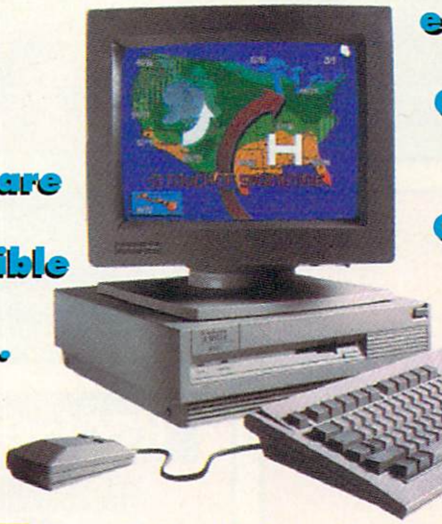
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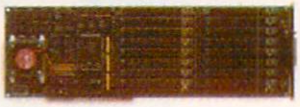
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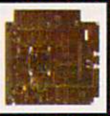
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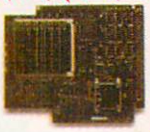
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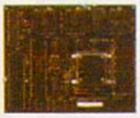
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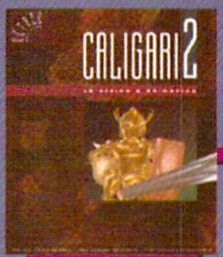


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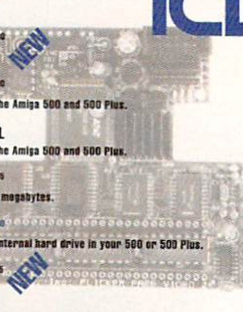
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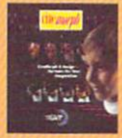
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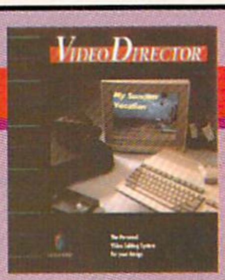
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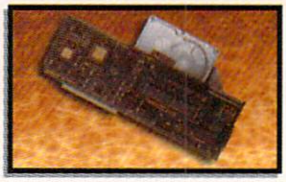
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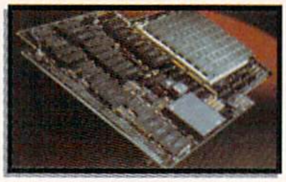


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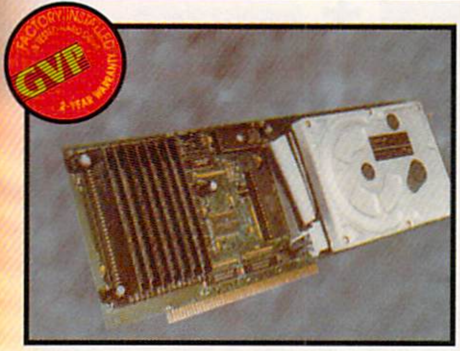
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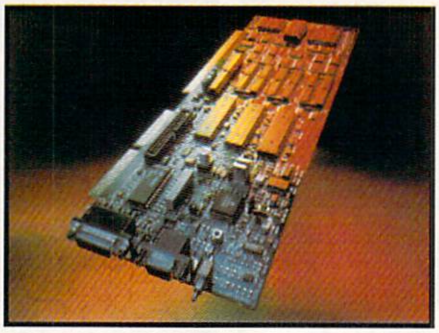
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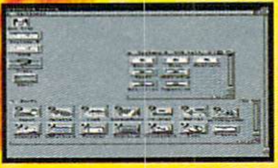
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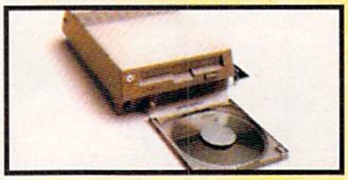
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The Wait is Over ...

The addition of A-Max II Plus to ReadySoft's acclaimed series of Macintosh emulators brings powerful new capabilities to your Amiga. A-Max II and A-Max II Plus are hardware and software combinations that, once you supply Macintosh 128K ROMs, run almost all Macintosh productivity software at full speed including Word, Excel, Quark XPress® and Illustrator®.

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- Built-in AppleTalk port to directly access Apple LaserWriters® and LocalTalk® networks.
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From p. 26.

tion recorded onto videotape. For best results, you must record the frames of the animation to tape one at a time. Single-frame recording, however, requires a frame-accurate VTR and a frame controller, which in turn demand a healthy checking account, but Nucleus Electronics has lowered the cost of this process with The Personal Single Frame Controller (or SFC), which sells for half the price of most other frame controllers.

Lay the Pipeline

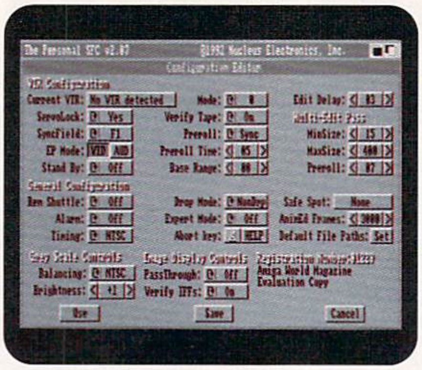
The Personal SFC package consists of a cable that connects the Amiga's serial port to a VTR's nine-pin connector, along with the software to control the recording process (among other functions). The only other component you need is a frame-accurate VTR that is capable of generating SMPTE time code. Even the most hardware-phobic person will have no problem installing the Personal SFC.

Once you connect the cable, you're ready to load the Personal SFC software. The configuration screen for the currently connected VTR appears first, containing many VTR-control options. The program sets the preferred default options for each deck, but you can later change and save them.

The main control screen of the program resembles a VTR's front panel with some extra options. A window displaying the current time code position of the tape takes up the top half of the screen. All of the standard VTR controls are available (play, fastforward, rewind, pause, and so on), as well as the ability to move forward or backward through the tape at various speeds via a Jog/Shuttle control in the center of the screen. If you prefer, you can use a joystick to control the Jog/Shuttle action. The bottom of the screen displays messages, such as error messages or the action currently underway. Some options, such as Quit or Record, require you to click on a Confirm button, which helps avert disasters.

The Personal SFC allows for two types of single-frame recording: recording previously generated images and recording frames as they are rendered by the Amiga. (I recommend the former method, as it causes less wear on the VTR.) To start work, you access the Animation Sequence List from the main interface. This screen consists of a list of images to be recorded and a toggle button that lets you select the display device to be used during the recording process.

The Personal SFC is compatible with all current Amiga display devices, including DCTV (Digital Creations) and the Video Toaster (NewTek). In addition, the



The Personal SFC's configuration screen specifies default options for each deck.

Personal SFC software is capable of loading device-dependent images, as well as IFF and ANIM files. As the images are loaded, the program checks each one to make sure it is a valid file, so that the recording process will not be interrupted by a bad frame.

You can load either single images or sequences of images. In the latter case, you have the option of recording the sequence several times in a row, creating a looping animation. Once you've created the list, you can edit several parameters, such as the SMPTE start time of the frames and the number of times each frame is recorded, which makes pause creation easy. Additions and deletions to the sequence list are simple to make, either on a selected range or individual frames. Copy, cut, paste, and insert commands are available, as well as the ability to insert "null" frames, creating gaps in the recorded animation. When satisfied, you can save or print your list.

As a final check before recording any frames, you can generate a small grayscale version of your animation with the Preview command. The software can also batch-convert images into IFF24 files or Toaster framestores, which load much faster into the Toaster framebuffers, speeding the recording process.

Start the Flow

Once the list is loaded and all the parameters are set, click on the Start button to begin the recording process. After this, it's just a matter of sitting back and letting the Amiga and the VTR do the work. When the job is complete, the controls on the main screen let you review the finished product.

The Personal SFC has other functions, as well. Besides recording single frames, it can grab frames from a previously recorded videotape in conjunction with a Video Toaster. You can also use the program to control a VTR for time-lapse photography or manual single-frame recording for stop-motion animations.

The manual is short but well written, containing all the necessary information to run the Personal SFC, as well as details on many types of VTRs. It also contains some useful tips, such as a chart showing which types of files load the fastest on the various Amiga display devices.

The Personal SFC worked flawlessly in my tests, making the job of recording animations to tape much easier. The software is very easy to use, and it took virtually no time to get up and running. The editing options on the Animation Sequence List make it simple to create the exact animation sequence you want. File-integrity checking and batch-file conversion are nice added touches. In short, if you want to single-frame record animations to tape, the Personal SFC is an essential item.

—Dave Thomas

ChromaKey II+

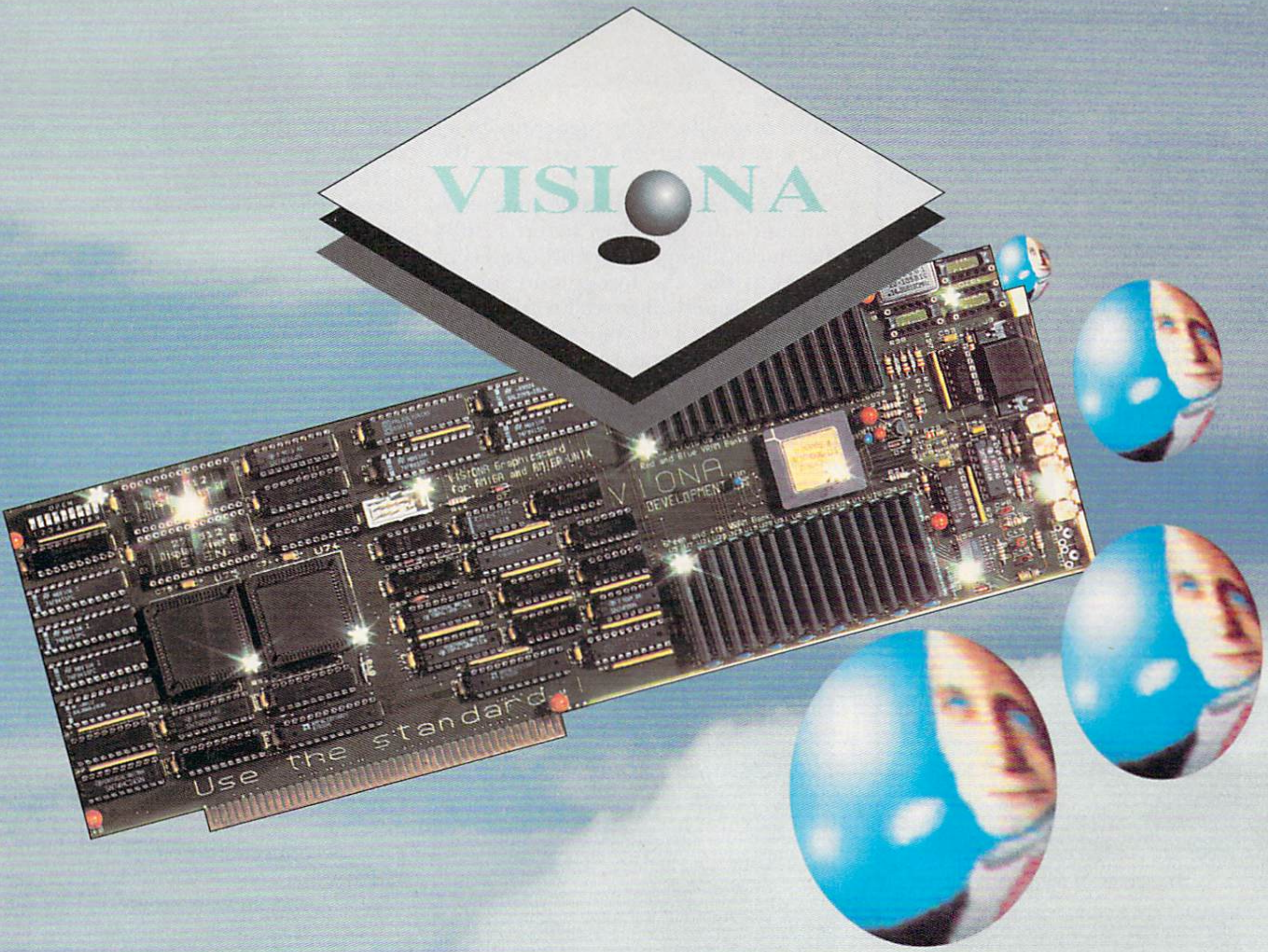
***MicroSearch,* $395.**

All models.
External, RGB port or Video Toaster connection.
Installation: moderate.
Compatibility notes: external genlock or Video Toaster required.

Combines live video over other video sources.

Updates and new versions are commonplace in this age of technology. In fact, many software vendors time the periods between updates more on the money aspects than on the new feature breakthroughs. Hardware vendors have a much more difficult time; they have to improve the features and remanufacture the product. So it's nice to see a good idea and a good product updated into a cost-effective and much improved piece of hardware. This is true with the new ChromaKey II+. The 5×6×1.5-inch box is pretty much the same as the original, but the interior electronics and flexiblity of working in conjuction with the Video Toaster (NewTek) are all new.

First, a short review is in order: The purpose of a "key" is to place video (generally live-action) over a background (either computer-generated or video footage). A genlock then mixes the two video signals together. For example, the Video Toaster's built-in luminance (luma) key lets you control the brightness level of the foreground video that is keyed out over the background image. A chrominance (chroma) key lets you re- ►



Real-time 24-bit graphics for your Amiga or Video Toaster!

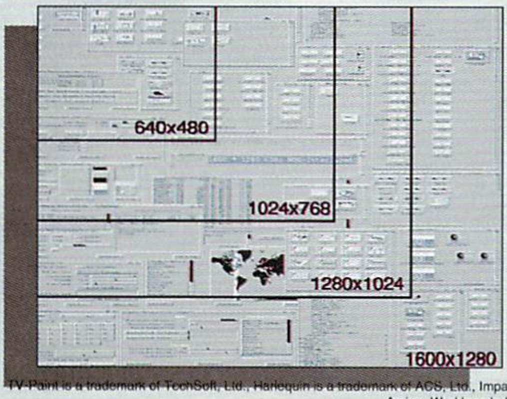
Introducing Visiona, a fully programmable real-time 24/32-bit 16.7 million color graphics card for the Amiga 2000 and 3000 series computers (unlike the Harlequin and ImpactVision 24 cards, which are merely framebuffers.)

Visiona is based on the powerful Inmos G300 GaAS graphics processor which runs at speeds up to 135 MHz and utilizes up to 4MB high-speed (20ns!) on-board memory. Visiona supports programmable screen resolutions of 1024 x 1024 pixels in 16.7 million colors up to an impressive 5792 x 5792 pixel monochrome resolution.

Workbench-Emulator (included) allows you to open the Workbench (or any screen that uses the Intuition library) in resolutions up to 1280 x 1024! Visiona comes standard with many powerful utilities and several 24-bit color games!

Optional Visiona TV-Paint software turns your Amiga into a professional quality 24-bit 16.7 million color paint box system. TV-Paint also works together with the Video Toaster! In fact, the Visiona together with TV-Paint is the ideal combination to replace ToasterPaint, allowing you to edit your Video Toaster images on-screen in full 24-bit 16.7 million colors.





Visiona requires an accelerated Amiga (68020 upwards) with one available Zorro II slot, hard drive, 3MB memory, and AmigaDOS 2.04 or later. Supports NTSC, PAL, HDTV and D2MAC video standards.

For more information contact your nearest Amiga dealer.

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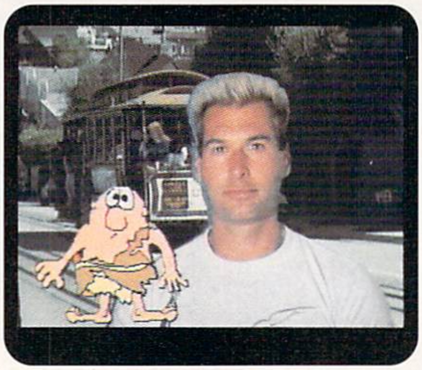
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Circle 157 on Reader Service card.

move a specific color (generally blue, but sometimes green or red) from the foreground.

Chroma keying is generally more controllable and produces better results than luma keying. The critical aspect of keying is that the foreground subject must be properly lighted. Even diffused lighting on each of your subjects helps avoid shadows on the background (dropout) color.

The ChromaKey II+ comes with power supply, new manual, blue chroma-key background cloth, demo video, RGB-interface cable, and Video-Toaster cable. In addition, you can now use an S-VHS or Hi-8 camcorder to input a chroma-separated signal into the ChromaKey II+'s S-VHS jack. Using only the



ChromaKey II+ lets you overlay video with video and transplant Los Angeles-based authors to San Francisco.

chroma information from this signal, you can achieve much cleaner edges on your foreground subject. However, my tests also showed very good (and improved) results without the S-VHS feed. For large projects, the manual suggests sources for obtaining additional blue cloth and Chroma Key Blue (or Ultimatte Blue) paint in case you need to cover a wall or props.

The ChromaKey II+ only keys live-action video and may be used with or without the Toaster. For use without the Toaster, you hook up the ChromaKey's RGB cable between your Amiga and your genlock's RGB input. (The supplied RGB pass-through cable can be a very tight fit on some Amiga models.) You then connect your composite-video input (BNC connections) and the optional S-VHS video input. Be prepared: To use the S-VHS input, you must open the ChromaKey's box and change a jumper; it is factory set for composite-only input.

The controls on the box permit you to select your genlock alone or the ChromaKey II+ as composite output video. The slider bar lets you fine-tune the chroma levels that need to be keyed out. A Normal/Invert switch also selects between a blue background or subject-area dropout .

Blue Butter for Your Toast

Video Toaster users will be very happy with the ChromaKey II+, as it gives them a choice between luma and chroma keying and is controlled completely from the Switcher. The previous version of the ChromaKey allowed only live video to be keyed over computer graphics. Now, when used in conjunction with the Toaster, the ChromaKey II+ can key live video over videotape footage. This type of connection, however, requires the special Video Toaster cable instead of the RGB pass-through cable.

In most cases, you loop the ChromaKey's composite video output through your time-base corrector (TBC) and into the Toaster's Video 1 input. The TBC is synchronized with the camera, and you are able to chroma-key over your videotape playback background on the Toaster's Video 2 input. The special Key Out cable is connected to either Video 3 or Video 4 input.

After everything is connected to the Toaster, all controls on the box are bypassed, and you control the key effect via the Toaster's Switcher interface. The magic is done using the Art Card effect crouton (looks like a keyhole on Bank F of version 2.0) and the Toaster's luma key.

First, set the Program Bus to Video 1 (camera), the Preview Bus to Video 2 (tape playback), and the Overlay Bus to Video 3 or 4 (ChromaKey II+'s Key Out cable). Then select the Art Card effect and set the luminance key (scissors icon) to white. At 000, your Toaster output will be live camera, and when you drag the T-bar down, the areas of blue will drop away to reveal the videotape background. In effect, the ChromaKey II+ outputs a "key signal" that has been converted to black and white. By adjusting the luma key based on this live-action signal, you can obtain a clean chroma key over a Toaster video source.

You can just as easily overlay a Toaster framestore by loading it into DV1 or DV2 and then using it as your video-source background. In my tests, my partner and I took it a step further, as you can see by the accompanying picture. With a second Amiga and a genlock, we genlocked the Toaster's combined Program output with a computer animation over the top (standard genlock). In this manner, we effectively layered a live-action person between videotape footage and a computer animation. (Thanks to Barbara ►

Lawrence Productions for the computer character animation.)

Outlay for the Overlay

The ChromaKey II+'s key output has been improved. The additional abilities of receiving chroma information from an S-VHS source and using the Video Toaster to key over taped backgrounds have significantly enhanced the product. While the ChromaKey II+ doesn't necessarily output a broadcast-safe signal, when used with the Toaster it shouldn't give you any problem with signal levels. If you want to include these types of effects in your productions, the ChromaKey II+ is a very good buy.

—Steven Blaize

QVCS 1.1

Quma, $129

Hard-drive installable.
Not copy protected.
2.0 compatible.
Accelerator compatible.
Minimum system: 1MB RAM
Recommended system: 1MB RAM, hard drive.

Tracks versions of frequently revised files.

QVCS 1.1 (Quma Version Control System) is the first commercial release of a version-control system for the Amiga. Popular on other platforms, especially mainframe and mini computers, version-control systems allow you to keep track of all the changes made to a frequently revised file or a project's group of files. Most frequently, programmers and writers use such systems to keep a history of edits to their source code and documents, respectively. As well as more advanced commands, they typically provide tools to store, retrieve, log, and identify revisions.

On projects that involve multiple users, these systems are also used to mediate access to files. A locking mechanism can ensure that a file may only be edited by one person at a time, while a merge command allows consolidation of two separate sets of edits to the same file. A side benefit is that QVCS reduces disk-storage requirements, because it only stores the differences between revisions, rather than storing every revision in a separate file.

Widened Appeal

Besides text files, QVCS also supports binary files. In other words, anything that the Amiga can store in a file may be kept track of. This broadens QVCS's audience from writers and programmers to anyone who keeps updating files and needs to retain access to old versions. It is useful, for example, to artists for graphics and animations, to musicians for MIDI songs and samples, and to desktop publishers for groups of files that compose a manual.

What handicaps this feature is the lack of a graphical user-interface alternative to the DOS commands. Most users are not programmers; novices may not know how to use the command line interface at all. Besides, many seasoned users prefer to use the Workbench, and even programmers are starting to use it for development.

QVCS consists of a group of 14 AmigaDOS commands. You can custom-tailor its default behavior via AmigaDOS environment variables and can later override most of these parameters by supplying optional command-line arguments when you're invoking a command. All the commands provide complete on-line help. Once QVCS is correctly installed on your system (via a script file), you can type a command name with no arguments to invoke a usage description.

To understand QVCS's operation, you need a few key concepts. The first is work files. These are the files you edit with your application. Second, each work file has a corresponding log file, in which QVCS stores the work file's complete history of edits and comments. You never directly edit these. Finally, the 14 QVCS commands manage the transfer to and from the log and work files along with other housekeeping chores.

The two most important commands are qput (to check a work file into its log file) and qget (to retrieve a workfile from its log file). The other commands let you view log-file comments, merge revisions, delete revisions (while maintaining their edits), and much more. Together, these commands empower you to keep a grip on your project.

Without exception, the ring-bound manual is complete, well organized, and highly informative, containing a table of contents, reference and tutorial chapters, appendices, a glossary, and an index. The manual's page layout, on the other hand, needs improvement. The margins are much too narrow, and the text-body font is also small. In combination, these shortcomings add up to a cramped appearance.

Only Game in Town?

QVCS is very similar to the public-domain Amiga version of UNIX's popular Revision Control System (RCS), which is available with full source code. How does QVCS stack up to RCS? The major difference is that QVCS supports both binary and text files, whereas RCS supports text only. Apart from that, the two are very similar in operation, even sharing many command-line arguments and important key words (Author, Date, Header, Lock, Revision, and so on). QVCS, however, has a few more features, and its user interface and operation are less cryptic and more polished than those of RCS.

QVCS is a fully featured and well-documented revision-control system, and I am confident that it will do its job well. I would like to see optional file-compression support in the future, but the only valid complaints I have are the missing Workbench support and the manual's poor page layout. If you need binary-file support, QVCS is the only game in town. If you don't, and you can do without technical phone support, you might want to consider the public-domain Amiga RCS as a cheaper alternative.

—Darius Taghavy

Blizzard Board

Preferred Technologies, $259 (with 0K).

A500, A2000, A1000 with adapter.
Internal, 68000 socket connection.
Installation: Easy, except for A1000.

68000 acceleration and RAM expansion.

The 68000 CPU is slowly going the way of the dinosaur as today's complex software tasks place a heavy burden on the 7-MHz board. Without speedier instruction processing, animations move sluggishly as they become more intricate, CAD programs take minutes to redraw screens, and detailed 3-D designs take hours to render. Fortunately, third-party developers are helping us break the 7-MHz barrier. Preferred Technologies' Blizzard Board is one such method.

The Blizzard Board is a 14-MHz 68000 CPU combined with a RAM expander that can hold up to eight megabytes of RAM. Designed to install in the 68000 socket of an Amiga 500 or 2000, it also works in Amiga 1000s that have a 68000-socket extender (available at most electronic stores). The installation requires opening up your Amiga's case, which, of course, voids any remaining warranty, unless an authorized service ►

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The graphic effects on this page were generated in seconds by Rambrandt Personal, Tecsoft's TV Paint and Mercury.

center does the job. If you decide to tackle the project yourself, the installation instructions are admirably complete, giving step-by-step descriptions of each procedure. The entire process took me roughly 20 minutes.

Once properly seated, the Blizzard worked as promised. I could not see any appreciable difference in speed, however, until I ran some games. Those games that can handle an increased clock speed really fly! It's like finding a whole new level, where everything has had too much caffeine.

The Blizzard comes with a utilities disk that lets you use the board at its maximum potential. One utility is CLI-based, and the other runs from the Workbench. Both let you change the clock speed, test the RAM, and map Kickstart into RAM so that you can operate in shadow mode, as with '030 and '040 accelerators. This allows your applications to use system functions at the current clock speed. The utilities even let you copy Kickstart to disk, so that you can change to the latest ROMs while retaining access to previous versions of Kickstart without buying a ROM switcher.

Only one problem detracted from the total satisfaction I got from watching my A500 do everything twice as fast. When I instructed the software to reboot in 7-MHz mode, the system went down with a flashing power light and blank screen. I made a telephone call to Preferred Technologies and found out that the Blizzard relies on the ECS Agnus chip for switching modes. My A500 has the older Agnus.

The representative told me that the problem had made it through the many development stages because most of the testers were using newer Amigas. He did assure me that the problem was solved in the A1000. He also warned me, however, that installing the Blizzard in the A1000 involves more than just plugging the board into a socket extender. The disk drive must either be removed (using ICD's Shuffleboard), or the drive's mounting bracket has to be cut down to make enough room for the Blizzard.

I attempted to use the Blizzard and my A500's hard drive simultaneously (using a GVP HC8 Series II A2000 controller in CEV Design's X-Pander Chassis), but I had no luck. I suspect that my 65-watt power supply was just overwhelmed, but the Blizzard's manual does not say anything about the board's power consumption. The board I was using had 4MB of fast RAM and 512K of shadow RAM. I'm sure that if the board was filled to its eight-megabyte capacity, the A500 would be at its peak power consumption.

Aside from requiring the ECS Agnus for software switching of the clock speed, the Blizzard Board did everything the manual claimed. It performed at twice the A500's normal speed, allowed mapping of Kickstart into RAM, and let me expand the system's RAM without touching the slot under the A500. I recommend both Preferred Technologies for their courteous and honest support, and the Blizzard Board for providing speed and RAM at a fair price.

—Michael Savoie

Hand Scanner and Touch-Up 2.62.

Merge-It 1.01, Scan & Save 1.01, and Tray.

Migraph, **$399 and $99, respectively.**

All models.
External, parallel-port connection.
Installation: easy.
Hard drive-installable software.
Not copy protected.
2.0 compatible.
Minimum system: 1MB RAM.
Recommended system: 2+MB RAM, hard drive.

Small-scale scanning and image touch-up.

If you're looking for a low-cost scanning system, Migraph has a solution— the Migraph Hand Scanner with Scan & Save, Touch-Up, and Merge-It software.

Fitting comfortably in your hand, the Migraph Hand Scanner has a 4.08-inch wide scanning head, enabling you to scan images from two to 14 inches long in monochrome. You can achieve resolutions of 100, 200, 300, and 400 dots per inch (dpi), as well as adjust the scanner for line art or photographs. A darkness control is also provided. The scanner plugs into a small interface box, which in turn plugs into your parallel port. A 15-volt dc transformer provides power.

Start Your Engine

You activate the scanner by pushing a button on its left side within ten seconds after you set your software, and you must keep the button depressed while you move the scanner down the page. Two small rollers in the scanner's rear provide stability, while a large roller in the front measures the scan length. A green LED on top of the scanner blinks whenever you scan too fast, and a see-through window enables you to view your image while scanning.

One megabyte of RAM is required, but more is recommended. Scanned images consume huge amounts of memory, and as the scanner has no on-board storage capabilities, the entire image must be transmitted to your computer's RAM. Each scanned dot uses one storage bit of RAM. Therefore, an 8×10-inch image scanned at 400 dpi would use about 1.6 megabytes of space.

Either Migraph's Touch-Up or Scan & Save software can control the scanning process. Touch-Up also offers many editing tools, as well as virtual-screen, custom-screen, overscan, and PAL support. Scanned images are usually larger than your screen, so I recommend using at least an interlaced screen, if not overscan mode or a virtual screen. You can adjust page size by pixels, inches, or centimeters. Both programs are forgiving of jerky scans.

Power Steering

The basic scanning process is straightforward. With either Scan & Save or Touch-Up, adjust your page and clip sizes, scan length, and resolution. Set the scanner for line-art or halftone and fine-tune the darkness control. When the green LED comes on, press the button and start scanning. The unit automatically turns off when you exceed the scan length or release the start button.

The monochrome results appear on the screen a few moments later, ready to be saved or converted to a 16-shade grayscale IFF image. During conversion, each dot becomes part of a six-by-six cell that is then converted into a shade of gray, reducing the size of your original image by 1/6. The latest version of Touch-Up now supports eight-by-eight dither patterns, as used in the Golden Image and AlphaData scanners.

While Scan & Save gets the image into your computer, Touch-Up lets you enhance it. You can scan your image into the page or a clip box, then cut, paste, fill, mirror, rotate, slant, stretch, compress, and distort it. Paint and drawing tools include spraying, creating boxes and circles, and drawing b-spline and Bezier curves.

Also available are three dozen fill patterns and four writing modes: Replace, Transparent, Reverse Transparent, and Exclusive-Or. In addition, Touch-Up supports several formats, importing and exporting IFF, IMG, PCX, TIFF, ►

This time we pulled out all the stops.

Until now, 3D modeling, rendering and animation was really 2D, enhanced with three viewing perspectives.

•

Unlike old programs, Caligari's direct manipulation actually mirrors the everyday world. Objects can be moved, rotated and scaled by simply pointing the mouse. No menus to access. Everything happens in real time.

•

In fact Caligari24 operates so much like the real world that you will be able to start creating and manipulating objects in minutes. Not just simple geometric objects. Organic Deformations, Point Editing and Extrusions can generate anything you can conceive. Of course your models are fully hierarchical.

•

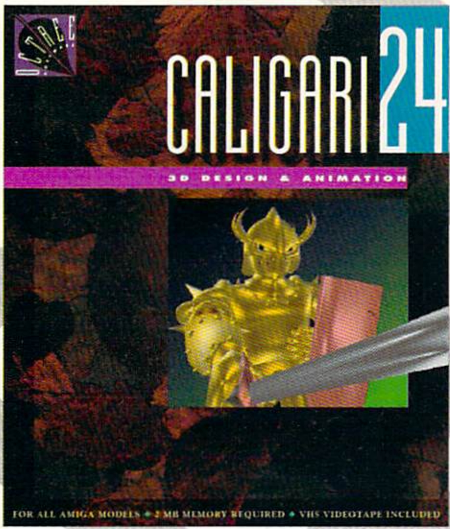
As animations go, you can easily animate a battalion of marching soldiers with just a few mouse clicks and present it with 16.7 million colors (plus 8bit Alpha).

•

You want Caligari24 because of what it will do for you... its 3D interface, its features, its speed, its photorealistic rendering, and its compatibility (including DXF) with other products.

•

You want Caligari24 because of who we are. Since 1986, profesional 3D software for the Amiga has been our only business. Our commitment to Caligari and the quality of our customer support is simply unmatched by the competition.



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The Power of Direct Manipulation

CALIGARI24


AmigaWorld cover, September 1992

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Circle 82 on Reader Service card.

Octree Software Inc.
1955 Landings Drive
Mountain View,
CA 94043
Tel. 415. 390 9600
Fax 415. 390 9755

MacPaint, and PrintMaster files, plus exporting EPS, Degas, and GIF files. An IFF and grayscale viewer are included.

Merge-It solves yet another part of the scanning puzzle. The biggest liability of hand scanners is their scanning width. Merge-It lets you stitch together strips of a large document. To facilitate the merge process, you should use a scanning tray to guarantee straight scanning and a better match between strips. Made of hard molded plastic, Migraph's tray has a built-in clear cover sheet, an $8^1/_2\times11$-inch grid sheet, and guide rails on each side. Using Merge-It is easy. Make two scans of your document, saving them as your left- and right-half images. Load them, select either one, and use the arrow keys to align the strips. Save the combination, and you have one image.

Although I like all of these products and find them useful, I have a few nits. No pass-through is available on the scanner's interface box, and its design makes it difficult to fasten it permanently to your parallel port (or switch box). On the other end, the tray's cradle prevents you from quickly removing the scanner. The device's cable must pass through an eyelet in the cradle, so you can't remove the scanner without turning it off and disconnecting it. The cradle provides a snug fit, so I don't see a need for enclosed eyelets.



Migraph's hand scanner can give resolutions of up to 400 dpi.

The software has inconsistencies, as well. Merge-It looks like an Amiga program, but lacks pull-down menus and overscan support. Scan & Save doesn't recognize overscan or virtual and custom screens. While Scan & Save makes you specify the scan resolution by setting the scanner switch, Touch-up lets you select the resolution through software.

Pit Crew

The scanner's manual is a good effort, but there are too many addendums and Read_Me files for my taste. Scan & Save comes with only a Read_Me file. The Merge-It handbook is multiplatform, covering both the Amiga and Atari. Last of all, I wish the manual provided more information about scanning theory and techniques. The best advice it gives is to scan, inspect, adjust, and rescan.

If you need additional help, the Migraph staff is friendly and knowledgeable. They send bug-fix updates upon request, have a generous upgrade policy, and are eager to hear your improvement suggestions.

If you need scanning on a small-scale basis, you'll have a hard time beating this package. The price is fair, the features are there, and the staff is supportive.

—Daryell Sipper ■

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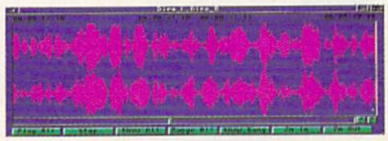
16 Bit Desktop Audio

AD516

The AD516 hardware provides stereo in/out connectors, plus a SMPTE in. Just plug your VTR, CD player, radio, tape deck, or other audio source directly in. Then record in stereo, direct to hard disk, with 16 bits at sampling rates up to 48,000 samples per second. Plus, the AD516's efficient design allows 8 track playback direct from hard disk. The AD516 can synchronize and chase SMPTE time code at 24, 25, 29.97, and 30 fps (drop or non-drop frame). Designed to exceptional audio standards, the AD516 offers 15Hz to 22KHz frequency response and 85dB dynamic range.

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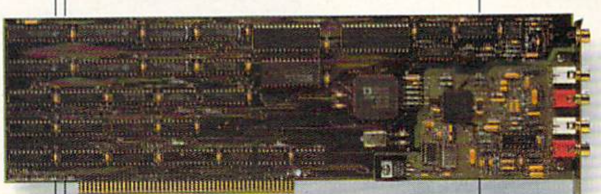
The Studio 16 sound editor graphs the audio waveform and allows you to cut, copy, and paste audio. Up to eight samples



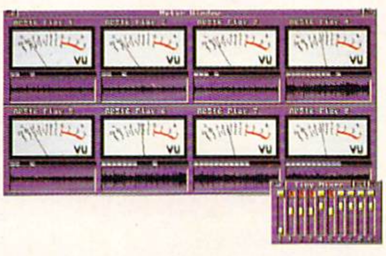
can be edited per window. And edits can be non-destructive or permanent. Zoom, scale, fade, reverse, echo, normalize, loop FFT, resample, and many other functions are available. Named regions can be defined and used in the cue list or transport modules.



Professional Digital Sound for Your Video, Music, and Radio Productions



Finally, true CD quality 16 bit audio is available for your Amiga! SunRize's new AD516 gives you eight tracks, plus a time code reader and a DSP chip. Included with the AD516 is Studio 16™ version 2.0. This new release of our popular 16 bit editing software puts a complete sound studio on your desk!



Video Production

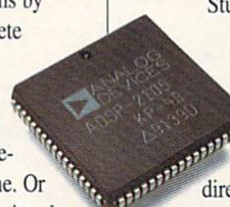
The Video Toaster goes a long way towards solving your video problems. But what about sound? Do you want to do ADR or voice-overs? Do you need to synchronize background music with your productions? How do you add footsteps, door knocks, and other sound effects to your video or animation? Do you need to fade, cross fade, or eliminate sections of audio? Can you edit your audio, or are you stuck with the first take? Studio 16 solves all these problems by turning your Amiga into a complete sound studio. With Studio 16's cue list and SMPTE support you can lock sounds frame accurately with your video. Audio triggers reliably, at the same spot, every time. Or you can slip your audio effects, trying them at different spots. And since Studio 16 plays directly off hard disk, the number of sounds you can trigger is unlimited.

Mixer and Meters

Each of Studio 16's eight tracks can be metered and mixed. Unlike two track systems, Studio 16 can combine multiple tracks with no generation loss. And it can record two tracks while playing up to eight!

DSP Supercharger

The AD516 includes a special sound coprocessor - the advanced 2105 DSP. The DSP allows Studio 16 to handle those eight tracks while performing real time mixing. The DSP can also do high quality 16 bit effects such as echo, flange, delay and chorus.



Low Prices, High Performance

Studio 16 2.0 comes with either the AD516 (16 bit, 8 track, stereo, $1495 list) or the AD1012 (12 bit, 4 track, mono, $595 list). Also available is the DD524 digital I/O card for direct interface to DAT. **Call today for a free Studio 16 information packet. Tel: (408)374-4962. Fax: (408)374-4963.**

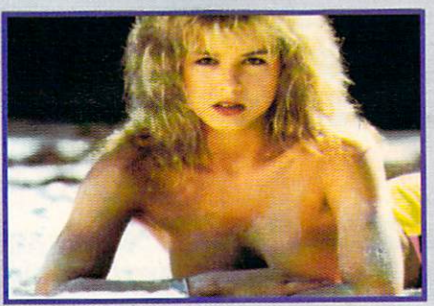
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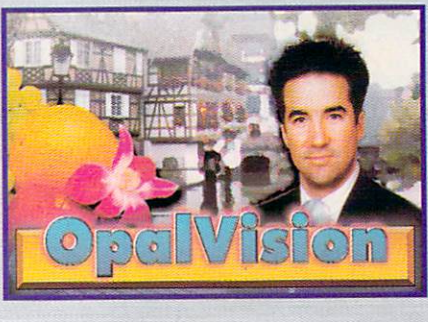
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The OpalVision Main Board

- An internal card which operates in any Amiga computer with a video slot. It is the core of the OpalVision system.
- A true 24-bit frame buffer and display device with 16.8 million colors available for every pixel.
- Uncompromised, 24-bit higher-than-broadcast-quality, crystal-clear images which far surpass any composite video or HAM system.
- Standard Amiga graphics and animations can appear in front of or behind OpalVision images on a pixel-by-pixel basis.
- Capable of double-buffered 24-bit and 15-bit animation in medium and low resolution modes and 8-bit double-buffered animation in all resolutions.
- VLSI graphics coprocessor enables resolution changes, stencil modes, a host of transition effects and smooth scrolling between screens.
- "Palette-Mapped" design updates screen colors in real-time. Fade pictures in and out and change their palettes on the fly.
- Occupies the video slot of any Amiga computer.

Technical Info

- Double buffered full 24-bit, 15-bit and 8-bit true color modes, 24-bit and 8-bit palette-mapped display modes, Dual Playfield and Overlay Priority stencil modes.
- Priority mask definition specifies foreground/background areas in 24-bit images.
- Microcode graphics processor for system control, priority switching, hardware scrolling and panning.
- 20ns video switch to freely mix Amiga and OpalVision graphics.
- Equipped with 1.5 MB of display RAM which leaves your Amiga's RAM free for other programs.
- Expansion connectors for available Framegrabber/Genlock and Scan-Rate Converter hardware modules.
- Expansion socket for the "Roaster Chip," a live video special effects processor.
- Automatically self-configures for NTSC or PAL operation.
- 24-bit RGB output with video bandwidth >7 MHZ.

The OpalVision Main Board is the core of a complete video system.

Enhancement Modules are on the way which add exceptional graphic and video features to the OpalVision Main Board. Create a complete video production studio by adding some or all of the OpalVision Expansion modules. The modules connect directly to the Main Board without tying up Amiga slots.

Frame Grabber + Genlock Module

24-Bit real-time framegrabbing and better-than-broadcast-quality genlocking with S-Video, RGB and composite inputs and outputs. Real-Time video effects, transitions and color processing.

Quad-input Production Switcher

Complete video switching capabilities. Includes four S-VHS, four composite and one RGB input. Three outputs: Composite, S-Video and RGB. Combine two live video sources, 24-Bit OpalVision and Amiga-generated graphics.

OpalVision Scan-Rate Converter

Perfect for desktop publishing and graphic arts applications. Generates flicker-free 24-Bit and Amiga graphics. Can also be used as a separate 24-Bit frame store for multimedia applications.

OpalVision Roaster Chip

Amazing, complex Digital Video Effects. Real-time processing of live video. "Picture-in-Picture" capability. Includes pre-made effects and provides for the creation of custom effects.

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OpalVision Software

Every OpalVision Main Board includes a full range of software to let you start enjoying all the benefits of your new 24-Bit Amiga immediately:

OpalPaint

Everyone is excited about OpalPaint. In fact, nearly everyone who's spent any time using it says it's the best paint program on the Amiga. And with good reason. It's Fast. Real-time. Full 24-Bit. OpalPaint gives you complete control over OpalVision's 16.8 million color palette. Includes a full-range of drawing tools and an expandable library of image-processing modes with adjustable parameters, complete texture-mapping capabilities, transparency and color gradients, multiple work modes, nozzle brushes, pre-defined palettes and many other comprehensive tools. Unique and powerful features like real-world "Artist's tools" and paper types, multiple stencil types, virtual memory support and compatibility with the pressure-sensitive Wacom drawing tablet provide a level of support for artistic creativity never before available on the Amiga.

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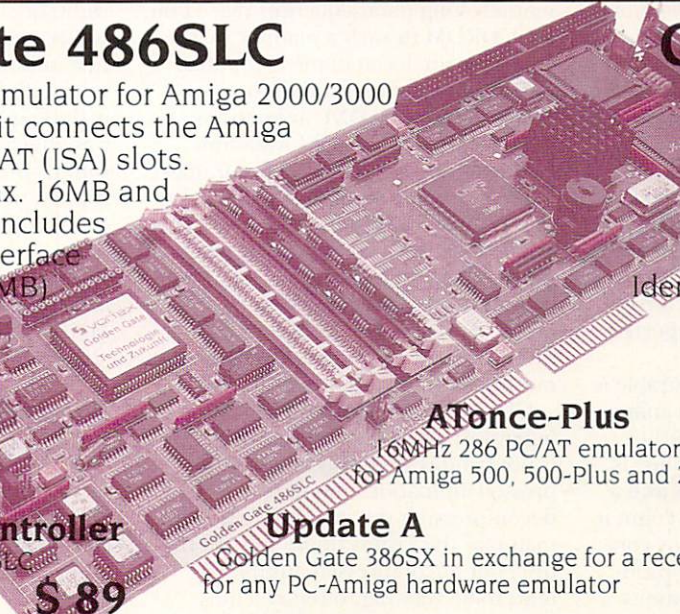
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HELP KEY

Lou comes up with a method of achieving a Quicktime-like animation format for the Amiga.

By Louis R. Wallace

QUICKTIME . . . MARCH!

Q. *I've been watching with great interest the new Quicktime animation format on the Macintosh, and want to do the same type of thing on my Amiga. Is there any Quicktime software for the Amiga, or perhaps an equivalent sound and animation player?*

J. Taylor
Knoxville, Tennessee

A. No, Quicktime remains at the moment a Macintosh animation format. Apple is willing to license its Quicktime code, although I haven't heard of any movement toward it by any Amiga developers. (There is, however, a rumor that Quicktime will be supported by some Windows programs.)

What makes Quicktime so desirable is its ability to combine audio with animations and keep them synced together. On most Macs the Quicktime "film" is limited to a rather small window and a slow frame rate. However, don't count it out because of that, because many companies are developing hardware products that make Quicktime animations run full speed as well as full screen.

While there is as yet no "multimedia" anim format for the Amiga, you can create animations with synced soundtracks using a number of products. The new Scala Multimedia presentation software has very strong animation and sound control, and demos I have seen show sounds being triggered at specific points in an animation. AmigaVision allows you to monitor the frames of an animation so you can wait for a specific frame before playing sounds. You can also make other products—like The Director and CanDo—perform similar tasks. However, none of these actually create an animation file with the sound embedded in it. To achieve that, you must use other software.

The first approach to this on the Amiga is the CDXL format developed by Carl Sassenrath for use with CDTV. CDXL is a technique used to transfer data from the CDROM into the computer as fast as possible. Because one of the biggest drawbacks to data transfer on CDROM is the very slow seek time, CDXL was developed so that only one seek was required. CDXL files are essentially long data sequences placed on the CDROM in such a manner that once they are located, the computer merely reads data continuously.

In the case of CDXL animations, these can have sound information interleaved between successive frames of an animation so that a CDXL anim player always has the sound and image available at the same time. This technique allows animations with sound to be played off the CDROM at rates of up to 15 frames per second. (To reach this frame rate, however, the images must be 1/4 screen, not full screen.)

CDXL has a lot of promise, but its biggest drawback is that the animation is not compressed. By using uncompressed animations, no time is wasted decompressing the images. This helps maintain the fastest frame rate off the disc, but uncompressed animations tend to be very big, often reaching many megabytes in size. Because of this, CDXL is generally used only for CDROM applications, or where the application has a very large hard disk.

At the World of Commodore show in Pasadena this fall, Axiom Software showed a new program called Anim Workshop. Developed by Cryogenic Software, this package allows the user to create, play, and then perform a wide variety of manipulations (scaling, format conversion, etc.) on every frame of an Anim5 format animation. It gets even better if you have ASDG's ADPro, as you can then use it to automatically manipulate and process all the frames in the animation. As powerful and useful as these abilities are, the Anim Workshop has yet another feature that multimedia authors and animators will find extremely useful. It can generate a "multimedia" animation, which is simply an animation with an 8SVX digitized soundtrack incorporated within the frames of the animation.

Anim Workshop's editor lets you specify at which frame of the animation you want the sound to begin playing and the sound channels to use (left, right, or stereo), as well as the priority of the sound. You can then save this new animation to disk, and when reloaded, it retains all the information, including the sound itself. Using it, I was able to create animations with sounds precisely synced to specified frames, which were nothing short of spectacular when played back.

For more information on Anim Workshop, write or call Axiom Software at 1221 E. Center St. S.E., Rochester, MN 55904; telephone: 612/882-8136.

AMIGAVISION RUNTIME OPTION

Q. *Is there is a runtime option for AmigaVision that can be licensed from Commodore? If so, how much would it cost?*

D. Jackson
Akron, Ohio

A. Yes, a runtime module was developed for use with AmigaVision v1.7 applications that were to be distributed commercially. The royalties varied according to the price of the application, but were generally quite low. For more information on it, you should write to the CATS group at Commodore's headquarters, 1200 Wilson Drive, West Chester, PA 19380. By the time you read this, however, a new, greatly enhanced version of AmigaVision will be available. AV Professional has been greatly expanded, with a parade of new features as long as your arm. I don't have room to list them this month, but we will be covering AV Professional in a future issue of *AmigaWorld*. One addition everyone will appreciate is the inclusion of a freely distributable runtime module that will let anyone use your AV flows, even if they don't have AmigaVision. ■

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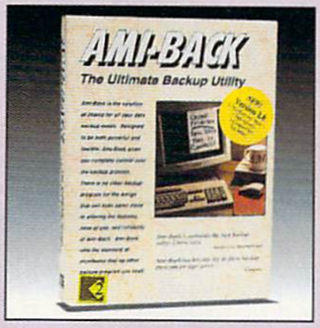
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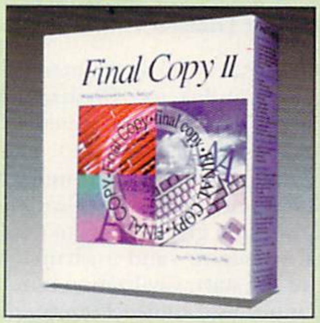
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The Game Preserve

Civilization

By Peter Olafson

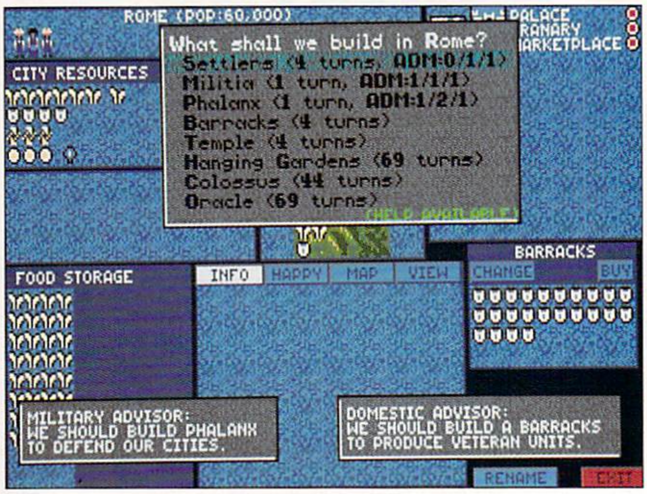
YOU CAN PUT away Interstel's Empire now. Warlords and Stellar Conflict, too. **Civilization** (*MicroProse*, $69.95) has arrived. If you have any appetite for conquer-the-world games, prepare to have it satisfied. This, my friends, is *it*.

Using a game system similar to Railroad Tycoon's, this Sid Meier confection has you leading a band of settlers at the dawn of time and gives you up to 6000 years to build a society—not just an empire—and crush up to six neighbors under your heel.

At the start, Civilization reminded me of a pretty version of Empire. But, unlike Empire, it's not simply a war game, although that's a good part of it. The cities you build and beat grind out a wide array of military units—from basic militia, knights, or riflemen to battleships and fighter planes, depending on your technology level.

Even diplomats, those most delicate and deadly weapons, are at your disposal. But Civilization also permits you to build the cities themselves: a granary, a marketplace, a barracks, a library, the Pyramids—each with its own time and resource demands and effect on the quality of life. Charmingly, when each improvement is complete, the game cuts to a bank-camera view of the particular city—taking care to update construction methods to the current era. When you do well, your people volunteer to make improvements to your palace.

Those are among the many nice touches. (Another is the "demographics" feature that ranks your civilization in a number of abstract categories.) But here's the key: Simultaneously, you have a passel of scientists working, at your behest, on a thicket of interlinked societal advances—from pottery making to the wheel to a cure for cancer. It's the guts of the game—what pushes your envelope forward. Without science, you can make only such progress as you appropriate or trade for. With it, you can quite literally take your civilization into orbit.



In Civilization, the world is yours for the taking.

Naturally, this lends delightful depth both to the war game and the "life" game in Civilization. It's an extraordinarily rich simulation—one that matures and evolves as it progresses. You'll probably still be playing this a year from now.

With MicroProse doing so many things right—the game ►

CRIB NOTES By Peter Olafson

December: A time when fire-lit rooms resound with the glad cries of children. A time when the air is brisk with the promise of snow. And a time, naturally, when people cheat like the blue blazes at their Amiga games...with our help. Hey, it's not quite as non-"family value" oriented as swiping Monopoly money behind Mom's back; when you can't finish a game you've owned since 1987 (or even since November), dishonesty may be the best policy.

A few caveats: I didn't collect these cheats myself—credit goes to a bloke who calls himself Postcard Man—and I've tested only a handful, so some may not work exactly as described, or may work only on the European version of the game.

• There's apparently a way to collect an infinite stock of supplies in Deuteros (*Activision*, $39.95). Go to the surface stores and type Shift-C. You should be rewarded with a green screen. Now do it again, and never want for anything.

• I'm not sure whether this is a real cheat or just an oddity. In Agony (*Psygnosis*, $49.99), pressing F1 places a sword beneath the owl, F2 puts it above the owl, and F3 evidently increases the size of the blasts you fire. Hit F3 three times, and you'll earn an extra life. There. That is a cheat.

• Typing GET MORDROC DIRK anytime during the game kicks Dragon's Lair II: Time Warp (*ReadySoft*, $59.95) into auto-playing mode—a nice feature that'll show you the whole bleedin' game. HURRYDEXTER0, followed by a press of the Return key, should perform the same stunt in Space Ace II ($59.95).

• The code BTTMNDHRCH takes you straight to Level 11 in Amnios (*Psygnosis*, $49.99). (Doesn't that look like shorthand or something?) SULPHATE will take you to Level 100 in Atomino (*Psygnosis*, $49.99).

• The codes ZXSP and LVFT will take you to Levels 2 and 3, respectively, in Leander (*Psygnosis*, $49.99). If you add the letters LTUS, you'll also have unlimited lives and access to any weapons in the game by using F1 to F5.

• The cheat for Elf (*Ocean*, $49.95) is about as cute as the game itself. Type CHEAT on a screen in which there is talking. You'll be told to type in CHOROPOO, and when you do, you'll get 99 pets and your energy will return to a normal level. I think we could all use 99 pets, don't you?

• Arkanoid II's pretty old, but hell's bells, somebody sent me a letter asking for a cheat that I never got around to answering, and this is as good a way as any to save 29 cents. Actually, there are a whole ►

To locate vendors of the games reviewed, see the "Manufacturers'/Distributors' Addresses" list on p. 117.

looks and plays virtually the same as the IBM version, and the sound is substantially better—I feel a bit queer blasting the few points that go wrong. But there are too many Amiga-specific faux pas in Civilization to simply ignore.

When booted from its Workbench icon, the game gurus upon exit back to Workbench. (CLI-ignited games run fine.) If you're starting a game from scratch, you have to sit through a lengthy introduction that moves like a logging truck going uphill and cannot be interrupted.

After some half-dozen hard disk-installable games, MicroProse still doesn't have its installation routines down pat. First, the program asked me if I wanted to install the four-disk game to the Speak:, Pipe:, and Aux: devices (among others) on my A3000. That, at least, was good for a laugh.

While Civilization's installation script wrote the proper assigns into the startup-sequence, it did so only after the line endcli >nil:, which prevented them from taking effect when I rebooted. I had to edit the file manually. The program also assumes that your machine boots from hard disk and so writes the changes into the startup-sequence file on the hard drive—not allowing for older systems, such as my A500, that boot from floppy.

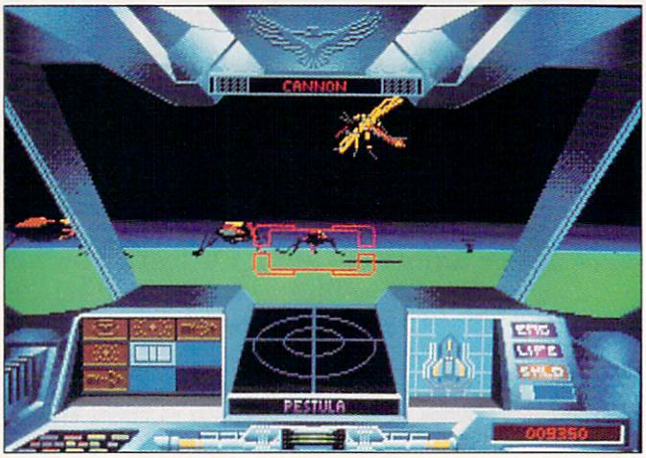
We can only hope that the just-released upgrade fixes some of these slipups. On the other hand, Civilization's play is virtually without flaw. It's the best conquer-the-world game you've ever seen, and much more besides. It's only a shame it takes so much work to get it started.

Nova 9

By Rob Lawrence

IN STELLAR 7, you creamed Gir Draxon to restore peace and harmony. Old Gir is a poor loser, however. After crash landing, he began his conquest of the unexplored Nova 9 system, massing incredible force. Hop in your Raven II hovertank: In **Nova 9** (***Dynamix***, $34.95), you take on Gir and his awesome mechanized minions again.

With enemies coming at you from both surface and air, you begin in the heat of battle on the first of nine planets to be liberated. Each planet has its own unique fighting force and a big bruiser at the end, with vehicles resembling everything from swamp boats and bulldozers to pterodactyl fighters and mechanical lizards. While the terrain is generally flat, you'll encounter obstacles, force fields, and even ramps for going airborne. Exploded enemies often leave behind goodies to increase your tank's speed and maneuverability, or give you ex-



Nova 9 is waiting for you and your hovertank to liberate it.

tra firepower or shields. One even produces a holographic twin decoy. You can also lay mines and (later) fire guided missiles.

The graphics and sound effects are very well done. Everything is in bright color, with shading. My only complaint about the sound is the absence of engine noise, possibly due to the little Yugo two-cycle under the hood. (Without speed modules, the tank's pokiness cost me my life more than once.) The frame rate is not bad until you run into a lot of action (hence the recommended accelerator). For more speed, you can reduce the detail and activate wireframe mode, but then perspective becomes tougher to judge.

The designers apparently thought Nova 9 would be best as an arcade game and abandoned its potential as a sophisticated simulation. For example, you receive radar and damage status information but have no velocity and heading indicators. You cannot raise your cannon to train on fighters smart enough to stay above firing level, nor can you transfer shield power to weakened areas. Despite the simplicity, however, I was impressed by the clever setup of each planet, and the unknown weaknesses of the guardians.

Although one megabyte of memory is required, you can play Nova 9 from Workbench. Hard-drive installation is a snap, but do check out the cool intro on floppies (only the second half played from my hard drive).

To sum it up, Nova 9 is a good sequel to a good game. It's a simulation leaning towards the arcade, but being slowed up

Continued on p.108.

CRIB NOTES

mess of cheats for this one. Typing DEBBIE S on the high-score screen gives you unlimited lives. When you croak, wait for the title screen to roll around, and then type DALEY-88. You'll be able to continue at the level on which you kicked the bucket. Or type MAGENTA, and during the game proper press S to skip levels. Try typing ROBOCOPPETER on this same screen for "continuous mode." I don't know what it is, but it sounds delightful.

• I still get mail now and again about *Psygnosis*' Baal—usually from people declaring that it is impossible—and this is the first real cheat I've seen. Evidently the game has a built-in "trainer" (practice mode) you can access by typing LOVEBUNDLE in the high-score table. Hurrah. Of course, to manage that, you've got to be good enough to reach the high-score table. Boo...

• You can make the marathon Midwinter (*MicroProse*, $39.95) into a rather short, tidy game by picking up some dynamite and a hang glider and making for the enemy HQ. If you click on the start screen in the same spot every time, every game will be set up the same way.

• Pit-Fighter (*Domark*, $39.95) has a level select. Just type LOBSTERS during the game and then 1, 2, or 3 for the one you want. C is supposed to take you to the championship level.

• *Rainbird*'s Enlightenment has secret levels. To reach them from the starting point, go left to the desert and continue left to the fire zone. Head to the upper-left corner and find some lava bearing a patch that resembles the Firewall spell. Walk on this patch—be quick about it—and you're on your way.

• When the storyboard appears in Back to the Future III (*Konami*, $39.95), type in ROTTEN CHEAT for Level 1, LOUSY CHEAT to reach Level 2, and LOW DOWN CHEAT to reach Level 3. (Hold on a sec: You have to cheat to reach Level 1?)

• OK, OK, it's not a domestic release at this writing, but Epic ($49.95), *Ocean*'s space-combat game, had people on pins and needles for about two years, and it seems only fair to give you the nine level codes: AURIGA, CEPHEUS, APUS, MUSCA, PYXIS, CETUS, FORNAX, CAELUM, and CORVUS.

• Not a cheat, but just kinda weird: In Bard's Tale III: The Thief of Fate (*Electronic Arts*, $49.95), try out the word HAMBURGER on the guard at the Mad God's temple.

• A few RPGs can be licked the easy way with some judicious disk

Continued on p. 108.

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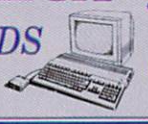
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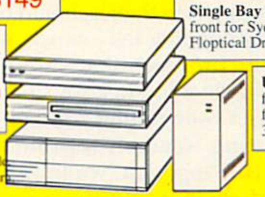
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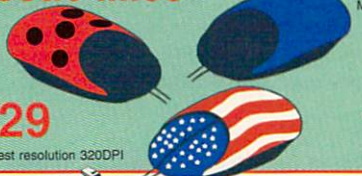
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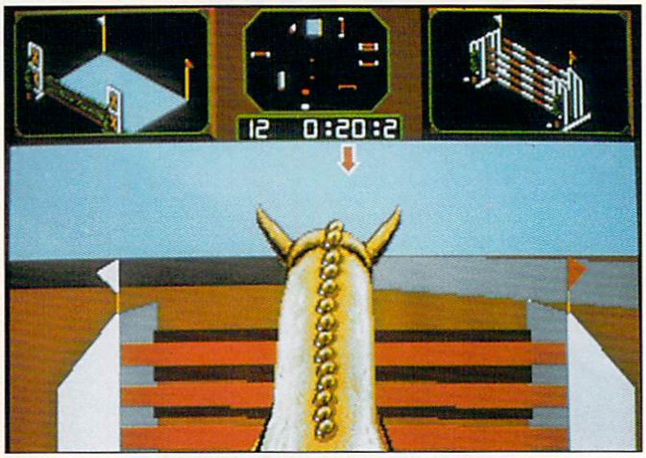
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by all the action. If there's a third installment, I hope it falls into one camp or the other.

American Gladiators
California Games II
International Sports Challenge
The Carl Lewis Challenge

By Peter Olafson

THIS OLYMPIC YEAR has brought a flood of Games-type games for the Amiga: **International Sports Challenge** (*ReadySoft,* $49.95), **The Carl Lewis Challenge** (*Psygnosis,* $49.99), **American Gladiators** (*GameTek,* $39.95), and **California Games II** (*Epyx,* $39.95). One is top-notch. Two are just okay. One is a dog.



International Sports Challenge puts you in the saddle for show-jumping and six other Olympic events.

International Sports Challenge

The International Sports Challenge is the hands-down winner in the current heat. Empire, the game's European publisher, seems to have set out to do a full-blown, white-hot version of the Summer Games. This worthy idea was beautifully executed across a nice range of sports: diving, swimming, shooting, cycling, show jumping, and a marathon. Yup, a marathon.

Unlike many similar compilations, all the events here are fun and stylish—especially the cycling and show-jumping, which are carried off in a smooth, filled-polygon environment. Shooting is the easiest (a matter of mouse control), and diving (matching the movements of a ball around a circle) is by far the toughest. Nothing wrong with that; it should be tougher to do a given dive than simply pointing the joystick in a particular direction.

While the prospect of a marathon worried me, you don't have to waggle a joystick for 26.2 miles, but only when you want to reset your runner's speed. It's a good strategy game, incorporating weather, refreshments, and separate times for each 10K segment, while permitting control of runner speed and rhythm and providing data on other stats. It's available only when you play a full slate of events, but it serves admirably to link them together—you drop back to the marathon after each event—and it makes them feel less like a set of little arcade games. Are there any fouls? Just one: This four-disk game doesn't install on a hard disk.

The Carl Lewis Challenge

In second place comes The Carl Lewis Challenge. The five track-and-field events—100-meter sprint, 110-meter hurdles, javelin throw, long jump, and high jump—are all nicely done, though they have much in common. They're all played on similar screens, while each of the events in International Sports Challenge has its own distinctive world.

Actually, the most original trick turned here is that you choose not only a control device, but also whether it controls your character's speed, rhythm, or "gearing" (how close you can come to hitting marks on the screen). If at first you're uncomfortable playing The Carl Lewis Challenge, try, try again.

Like ReadySoft/Empire, Psygnosis added a strategy component—a training module that you can play separately or with the events. Sad to say, it's best played once and then skipped forever. This is a pure numeric exercise in which you adjust ten types of training in three areas over five weeks to bring each athelete's four stats to optimum levels. The human element so present in ReadySoft's marathon is utterly absent here. It's more like being Carl Lewis's accountant than his trainer.

American Gladiators

A ways behind the leaders is American Gladiators, based on the cartoon-like TV show of the same name. It consists of seven futuristic events, played either head-to-head or in tournament, and they're a rather mixed lot. The best—Assault, Atlasphere, and Powerball—look like miniature versions of the Bitmap Brother's Xenon or Speedball. The worst are just too simplistic to be of enduring interest. (Then again, I found one of the simplest—a wall-climbing exercise—the most charming.)

I hate games that make me plug a joystick into the mouse ►

CRIB NOTES

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swapping. Eye of the Beholder (*Strategic Simulations*, $49.95) is no exception. Make two copies of Disk 2, and play the game as you normally would with one of them—until you find secret passages or unlock doors. Now, insert your other copy and play with it for a while—long enough at least for the data to be written to the disk. Then put the first disk back in and continue to play. So where's the cheat? Well, if you get stuck in the game, go back to the second copy, and you'll find that all the locked doors are now unlocked.

• You can reach two special levels in *UBI Soft*'s war game, Battle Isle ($49.95), with the codes EUROP and STORM.

• A few helping hands for flight sims: A simultaneous CTRL-ALT-R replenishes all your weapons in F-15 Strike Eagle II (*MicroProse*, $59.95). In F-29 Retaliator (*Ocean*, $19.99), sign up as THE DIDY MEN on the duty roster without hitting Return. Click on COLONEL, and now press Return. You've entered the developer's test mode. Your stock of weapons is unlimited, and ENTER will bring you in for a nice smooth landing (unlike the nasty, firey type you've grown used to).

I'm not sure this will work on Strike Aces (*Accolade*)—the program was tweaked somewhat from its European release as Fighter Bomber—but give it a try anyway. Name your pilot BUCKAROO. You should be able to choose any mission, and use the D key to head for your next target.

• *Psygnosis*' Blood Money is still an open wound for lots of Amiga gamers, and I can't resist twisting the knife a little. I couldn't get this trick to work, but it's reported that hitting HELP and then 1 or 2 during the game restores the respective supplies of lives and money.

• There's evidently a level-select hidden in The Blues Brothers (*Titus*, $49.95). To reach it, type HOULQ on the character-selection screen. If the black background changes to maroon, the fix is in. To pick a level, simply hit 1 to 6 and then the space bar.

• That's all for this issue. Have some eggnog, and try these out. I'll see you next year. □

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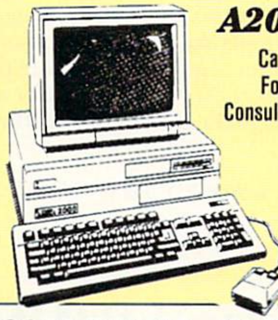
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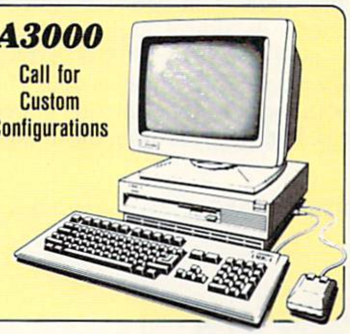
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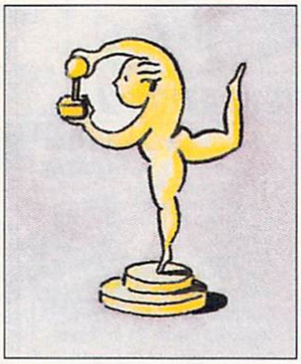
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port (as this one does), and the graphics on the final, most elaborate event—an obstacle course—were so ridden with glitches on the A3000 that it was impossible to play. But it's a very snappy-looking program—especially if you like red, white, and blue—and fans of the show shouldn't be too disappointed.

CALIFORNIA GAMES II

Finally, crawling across the finish line is the two-year-old California Games II. CG II's battle for the title of "supreme dude" consists of five bland events—two of which are similar to those in the original game. It's very much an IBM conversion. The music is sharp, and the smooth movement on the title screen left me expecting great things, but the art is drab, the animation mostly crude, and the excitement minimal. (And it doesn't run from hard drive or on the A3000.)

The skateboarding sequence is slow, with the skateboarder sometimes disappearing, and the comeuppance for inept play can be unnecessarily gory. The bodyboarding scene would be dull even if it were brief, and it's interminable. The snowboarding event shows traces of Epyx's quiet sense of humor, but seems to permit cheating (by simply heading down the right-hand margin). The hang-gliding segment doesn't have enough room in its sky or enough options to keep you flying. And the jet-skiing segment, though reasonably speedy, will take you back to those mediocre boat-racing games of two and three years ago. Leave this one on the bench.



THE 1992 TOP TEN

BY PETER OLAFSON

HERE'S A PARADOX for you. You hear about U.S. software companies trimming their agenda of Amiga game releases, and yet for the year since AmigaWorld's last games issue produced standouts in virtually every category, I was hard-pressed to pick only the ten best. (Okay, so I cheated and tossed in a couple of ties.) And next year is already shaping up to be a doozy—as the forthcoming Christmas crowd foreshadows. As a peek into the future, I've included a few wish-they-were-heres at the end of my annual top ten.

10. Pinball Dreams (*21st Century*, $39.95) Frighteningly real electronic pinball.

9. Leander (*Psygnosis,* $49.99): Gorgeous-as-usual arcade-adventure stuff from the masters, and even playable.

8. A tie: **The Perfect General** (*Quantum Quality Productions*, $59.95), **RoboSport** (*Maxis*, $59.95), and **Battle Isle** (*UBI Soft*, $49.95): The Amiga war game comes into its own. Make tanks, not love.

7. Fighter Duel (*Jaeger Software*, $49.95) A spartan but absolutely silky WWII-era flight simulator—in interlace, no less.

6. A tie: **Might & Magic III** (*New World Computing*, $59.95) and **Ultima VI** (*Origin*, $69.95): M&M III is a wonderfully pretty, exciting, amusing, and enchantingly large first-person role-playing game. U6 is quite simply the most detailed Amiga role-player ever created. Who says ports don't measure up to IBM originals? Beauts, both of them.

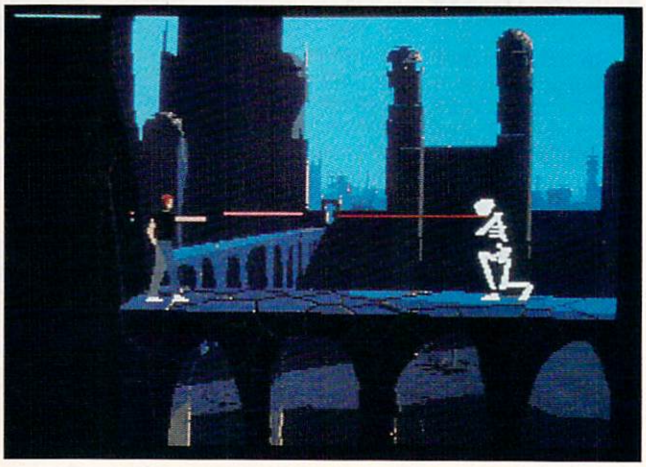
5. Monkey Island II: LeChuck's Revenge (*LucasArts*, $59.95). Incredibly enough, it manages to go the original animated adventure one better.

4. Gods (*Konami*, $39.95): England's Bitmap Brothers strike gold in this arcade-adventure extravaganza.

3. Knights of the Sky (*MicroProse*, $59.95): Take the feel of the dogfight mode from Wings and spread it over a whole flight sim and you've got KOTS. Simply brilliant.

2. World Circuit (*MicroProse*, $59.95): Buy this. It is the best car-racing game on any computer ever. Buy this. (Did I tell you to buy this?)

1 Out of this World (*Interplay*, $59.95): Amiga Gold. A dazzling polygon-based arcade adventure from France's Delphine. (Wait 'til you see the followup to this one: Flashback.)



Honorable would-have-been-mentioneds (if AW had a three-week lead time instead of three months): **Lure of the Temptress** (animated graphic adventure, *Konami*), **Heimdall** (arcade-RPG, *Virgin Games*) and **RoboCop 3D** (first-person arcade, *Ocean*). □

Game Preserve continues on p. 115.

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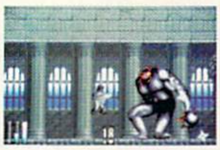
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SHORT TAKES By Peter Olafson

From p. 110.

Mega-Lo-Mania

Let me get the obligatory part over with first. This enjoyable PowerMonger clone won't be officially released here. (UBI Soft, which did the IBM version, found the Amiga version already widely available.) But you'd do well to pick up the English import from *Sensible Software* (about $40); it's very entertaining stuff.

Essentially, this is PM with a more restricted environment—a series of nonflowing, square-ish territories—and with data disks built in. (You're not restricted to feudal or WWI technology.) There's much more in the way of resource management, and the whole second disk consists of digitized voices, which, once you pick up the accent, add greatly to the fun. This isn't up to the level of PowerMonger in challenge or involvement—it's closer to Virgin's Realms—but it's nevertheless delightful in its own right.

Air Force Commander

Hey, nice game! If you'd gotten used to thinking of Impressions only as the developer of the rather shabby war games released here by *Merit*, think again. Air Force Commander ($59.95) is an excellent, highly playable game of air war over the Middle East. It features zoomable maps and loads of scenarios (even the basic one provides a decent challenge), is quick-scrolling and preserves a point-and-click spirit. It's a bit like playing Psygnosis's Armour-Geddon in map mode, and I mean that as a compliment. A very pleasant surprise.

Red Zone

The red zone is the spot on the RPM dial that tells the driver when to shift gears or risk blowing the engine. *Psygnosis* blows its engine on this disastrous motorcycle-racing game. Red Zone ($49.99) is virtually uncontrollable; you'll spend most of your time peeling yourself off barriers. It's not even that original an idea. (We've already seen Konami's filled-polygon motorcycle-racing game, Team Suzuki.) C'mon, this isn't like you guys. Too bad Psyclapse folded; Red Zone would have been perfect for it.

Dojo Dan

There's a whole cottage industry in Europe devoted to making this kind of happy platform romp. They look and play at least as well as anything you're likely to see on the 16-bit consoles, and Dojo Dan (*Europress*, about $36) is better than many. You steer cute little karate-kicking, headband-wearing Dan around a richly colored, 20-level landscape, battling almost equally cute enemies and picking up the usual energy-rich stuff that everyone leaves lying on the ground in these games. The graphics, sound, and animation are all sharp, and it runs on the A3000. The only discernible problem with this one is a case of the cutes—which may put off some older gamers—and a banana-split-rich palette that occasionally makes sprites difficult to pick out from the backdrop.

Treasures of the Savage Frontier

Treasures of the Savage Frontier (*Strategic Simulations*, $49.95) isn't a bad game if you have a fast machine with a hard disk or multiple floppies and can abide the garbage graphics, eternal combat, and the limits of SSI's creaky old gold-box system. SSI has been plowing roughly the same field for more than a half-dozen games in three separate game lines, and the ►

MORE SHORT TAKES

original AD&D engine was not the greatest system to begin with. (It's so prominent you almost feel you're playing with the system, rather than playing the game.) It's time to hang the gold box up in the rafters and bring in a new boy.

Now, that said, I must add that if you're a fan of this line of games, Treasures—which takes up where Gateway left off—probably won't let you down. The story does hold the interest, at least for a while, and it's nice to play from hard disk, which Gateway didn't support.

Action Stations! Scenario Utility Disk
The Perfect General: WWII Battle Set
Bountiful Golf Course & Firestone Country Club

Data disks. Ya love 'em, right? Just when a game seems played out, its little brother wanders in and adds some life to it—maybe even adds a feature or sprays a nagging bug. We've been treated to a fair torrent of data disks in recent months, and none of them should go to waste.

It's difficult to imagine anyone getting tired of Action Stations!, an utterly absorbing naval-combat simulation, but *RAW Entertainment* has brought out 13 scenarios (ranging from battleship standoffs and a hypothetical German amphibious invasion of Sevastopol), 28 new surface-ship classes (17 of them battleships), and three helpful utility programs. This goes beyond the call of duty; it's not just a scenario disk, but an upgrade—all for $21.95.

The WWII Battleset ($34.95) actually makes *Quantum Quality Productions'* superb wargame, The Perfect General, even better. The data disk gives the game a real-world handle with 15 scenarios, ranging from Pegasus Ridge to Guadalcanal to the Kasserine Pass. I'm playing these even more persistently than the original.

Access has come out with two drop-dead gorgeous course disks (Bountiful Golf Course, $9.95; Firestone Country Club, $24.95) for its drop-dead gorgeous golf game, Links. Kinda tough to review golf scenarios (this is more to let you know they're out), but these two courses offer all the realism and beauty with which the original game abounded.

Jaguar XJ220

Vroom, vroom. The software house responsible for games like Virgin's excellent heli-sim Thunderhawk has come up with the fastest Outrun-type racing game yet. The scenery (lots of it) in Jaguar XJ220 (*Core Design*, about $40) justs blitzes by, the weather and road conditions (the fog looks great) lend a real hothouse feel, the tunes on the radio are listenable, the whole thing is dressed to kill, and there's even a bloody editor. (No hard disks need apply, unfortunately.) What, you don't possess this one already?

Pit-Fighter

Pit-Fighter (*Domark*, $39.95) was a supremely popular beat-'em-up in the arcades. It's an ugly old basher on the Amiga. It's easy to imagine the appeal of the original. You can choose among three fighters. (Guys, here's a fiver. Buy yourself a three-pack of T-shirts.) The playfield's depth lends a certain amount of strategy, *a là* Golden Axe, and you can pick up items (even motorcycles) to hurl at your opponents.

The poorly digitized character graphics are only a couple of notches up from, say, Shinobi, and the game's samey look and limited options quickly turn monotonous; it's like playing Double Dragon without the scrolling backdrop. The mild flakiness of the manual—check out the description of the game's one female character—almost redeems it.

Conflict: Korea

You can't call Korean Conflict the forgotten war anymore. *Strategic Simulations* remembered it in Conflict: Korea ($19.95), and, as war games go, this successor to Red Lightning and Conflict Middle East isn't too bad. Sure, the graphics could use a serious facelift, and the scrolling does The Jerk even on fast machines, but it's a quick play (largely on account of a slick game system), a breeze to pick up, multifeatured and pretty tough. (On the first few turns, about all you can do is get out of the way of the Chinese.)

GM Football

It looks like an Atari 800 game. It sounds like an Atari 800 game. It plays like an Atari 800 game. This followup to BASIC Football does offer the agreeable abilities to scout players and draft teams head-to-head with computer opponents, and it does pay heed to in-game player stamina.

Alas, the games themselves remind me of the old football game in which you placed the defense play over the offense play and turned on a light bulb underneath to see the result. The same combination of plays seems to produce the same result time and time again. GM Football (*Mahoney Software Products,* $39.95) is a 4th and 15 situation. Punt, coach!

THE NEXT ROUND

COCKPIT PRO—Jaeger Software has given its popular flight simulator a promotion. Fighter Duel Pro ($59.95) now offers 16 Allied and Axis aircraft, a review mode, multiple bogeys, catapult launches, new land-based scenery, rudder-pedal support, and an unrestricted panorama. It also allows you to connect a second Amiga via the flight computer's parallel port and a $15 adapter. Plus, with a $15 adapter you can connect a second computer through the main-flight Amiga's parallel port, letting you battle an opponent through the serial port while watching the action on the slave system. (RS# 101.)

SWITCHEROO—Tired of playing unplug-and-change with your cables before you can play your new game? Check out the Amiga Smart Port (InterACTIVE Digital Devices, $52.95), an auto-switching, game-port interface system. Connecting to both Amiga mouse ports, the Smart Port offers three connectors: mouse, digital joystick, and PC-compatible dual-joystick game port. To use several peripherals (even rudder pedals with a $7.95 adapter) simultaneously with a mouse, flip the mouse-mode switch. Leave it in the "normal" position to use a three-button mouse. The accompanying SmartPortCal software helps you adjust the analog ports for maximum performance. (RS# 102.)

DECLARATIONS OF WAR—Three-Sixty has whipped its fighting forces into shape for the Harpoon Challenger Pack, Signature Edition ($79.95) and Theatre of War ($49.95). The latest Harpoon installment includes the version 1.3 of the Harpoon master game, BattleSets 2, 3, and 4, plus the Scenario Editor. Theatre of War pits you against a computer or human player on modifiable playing fields offering multiple terrain types. (RS# 103.)

JOIN THE FUN—Got a new game in the works? Tell us about it. Send all the particulars to The Next Round, AmigaWorld, 80 Elm St., Peterborough, NH 03458. ■

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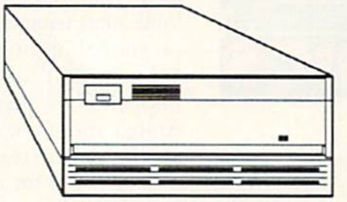
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Virtual Portraits For Holiday Gifts

#46

A continuing series of tips, techniques, and tricks for creating more imaginative Amiga graphics.

By Joel Hagen

EVER GIVE A present to the person who has everything and watch that jaded look creep slowly across his face as he stammers out a polite thank you? Well, next time try giving the hard case on your shopping list a nicely framed "photograph" of something that never happened to pique his interest. Your Amiga and a few simple software tricks can help you create a virtual portrait as a unique gift for any holiday occasion.

By way of example, the illustration accompanying this column shows me on the right, my father on the left, and his father between us. We are standing on a Denver street my father knew well in the late 1930s. The framed copy of this photo that I gave him for Father's Day was so convincing that he was baffled as to how and when it could have been shot. This column will explore basic computer-painting techniques you can use to craft such a gift.

The Willing Suspension Of Disbelief

To create a virtual portrait, you must maintain the illusion that it is a real photo, although the subjects never met in the same time and space. Good judgment and care at each phase are important to preserve this illusion.

The most important step is the initial selection of images. If you can find photos with similar lighting, sharpness, and contrast, your job of composition will be much easier. The direction of the light is not as important as the angle of light and shadow, because images can later be flipped to match directions. Images of different sizes can also be scaled later, but never enlarge a captured image to match other figures; instead, shrink the larger ones.

Use a scanner or video digitizer to capture photographs in the highest resolution your software and memory permit. If you work in color, use a mode that offers the greatest number of colors to preserve as much detail as possible. It is the nature of this project that some source images may be black and white. Be open to black and white as a final image format; it can often be more dramatic than color.

Let's look at just a few of the many possible compositing techniques in three paint programs: **DeluxePaint** (*Electronic Arts*), **DCTV Paint** (*Digital Creations*), and **Digi-Paint** (*NewTek*). *(To locate the vendors of products mentioned, see the "Manufacturers'/Distributors' Addresses" list on p. 117.)*

In DeluxePaint high resolution, a black-and-white image takes up the entire palette with the 16 grays of native Amiga display. Reduce each image to 15 grays by using Change Color BG>FG to change all value-15 white to value-14 gray. Then select the unused color as the right-mouse-button background color. Carefully paint with this color around each figure to isolate it as precisely as possible. Letting the unused background color be transparent, pick up the figure as a brush and place it in the background image.

If the figure does not appear to blend in smoothly, switch to the spare screen, select the unused color with the left button, and press the o key to outline the figure brush in that color. Clear the screen to black, stamp the figure on the screen, and bring up the Stencil requester. Lock the unused color, select Make Stencil, return to the screen, and clear it again to black—leaving only the protected outline. Free the stencil, pick up the outline as a brush, and press the o key again to thicken the line.

Return with this brush to the image in progress, select Smooth mode, and position the outline precisely over the edge of the figure. Press the left button to smooth the entire border of the figure into the surrounding background. Repeat this process for each figure to achieve a look of smooth integration. (For more on DPaint compositing tricks, see "Accent" #21, Nov. '90, p. 66.)

Not by DPaint Alone

With DCTV Paint or Digi-Paint, there is an easy way to assemble multiple images

These sleight-of-hand compositing tricks will yield some out-of-the-ordinary gift ideas designed to keep 'em guessing!

using the Rub-Through mode. In DCTV, load the background image and then hit the j key to switch to the spare screen. Load the figure to this spare screen. Use the Scissors tool with Freehand Line to cut out the figure as a brush. You can be quite sloppy in cutting the figure—just be sure to cut outside the figure itself. Press the j key to return to the background image and then (shift)-J to copy the background to the spare screen. Position the figure brush on the background (use the Tack tool if needed to get the brush) and press the Paste button to stamp it in place.

Next, click the Brush tool, and then select Solid and Rub Through mode. Use different brush sizes with the dotted-line tool to carefully clean up the edges. Rub Through mode pulls the clean background through your brush strokes from the spare screen. Use Undo if you make a mistake. Experiment with flow rates around 10% at the border of the figure for a soft edge. For final touch-up, use Smooth and Blend modes at a 50% flow rate to eliminate the "cut-out" look. Repeat this process for each new image element. This is an excellent way to composite multiple images in full-color high resolution.

You can use Digi-Paint and follow the above instructions almost word for word to get similar results in lower resolutions. While Digi-Paint is usually thought of as a HAM program, the procedure outlined above is particularly powerful in black and white. To eliminate artifacting, load the palette from the gray-scale image and turn Dither off before using Rub Through. Also, try experimenting with Digi-Paint's transparency controls for a soft-edge rub through; keep the center transparency slider at the top and the edge slider at the bottom.

If it is necessary to do any color or contrast balancing on the images, do so with **AD Pro** (***ASDG***) or **Imagemaster** (***Black Belt Systems***) prior to assembly if possible. Experiment with saturation, contrast, gamma, and brightness as needed. You might even try blurring or sharpening an image to achieve uniformity with others.



In "Three Generations" (above), grandfather, father and son meet in a composite virtual portrait. The 16-color black-and-white palette was manually altered to sepia tones.

Output to a film recorder such as the Polaroid CI-3000 linked to AD Pro, or simply use a camera to shoot the monitor in a dark room. Laser printout can be quite effective, too. I use AD Pro's PostScript output to a NEC Silentwriter. I also like AD Pro's Prefprinter output using Floyd, density 4, with a gamma correction of +36. You can also send your image out on disk to a service bureau to be converted into a high-quality photograph. Check ads in the "InfoMarket" section of *AmigaWorld* to find some of these services. ■

Joel Hagen's credits include work in art, astronomy, science fiction, and software development. Write to him at 10512 Sawyer, Oakdale, CA 95361. Please include a stamped, self-addressed envelope for a reply.

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WB53: Graphics - Raytracing programs generate absolutely stunning realistic looking planes, rockets, buildings..., and surreal images often consisting of highly polished spheres and objects. C-Light is the most powerful EASY-TO-USE of it's kind we have seen to date. This is easily better, and more full featured, than similar commercial programs costing in the hundreds of dollars. Also, sMovie - a full featured video text titler similar to ProVideo, Broadcast Titler. Great video scrolling, wipes, special effects, and more...
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WB66: Icons #2- Lot's of neat icons. Also, several wonderful programs that to let you create your own icons, modify and manipulate icons and info structures.
WB68:Music Utilities - several good utilities for the Amiga music enthusiast. Includes, Noisetracker - a great music creation program, Sonix2MOD - converts sonix to .mod files which then can be used by noisetracker, soundtraker, and MED, SpeakerSim - a speaker design tool demo, Wondersound is an additive harmonic instrument design tool with a separate envelope design window and 16 relative harmonic strength and phase angle controls.
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Virus Checker - Full virus protection can be yours by simply dropping this icon in your WBStartup drawer.
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WB111: Cellular Automa - Straight from the pages of the January 1990 issue of Scientific American, this electronic model will allow you to simulate cellular circuits.

DEV DISKS

DD45: AREXX Programs - This disk contains several useful arexx programs and examples, PopCLI4 - The latest of a must have utility.
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DD55: ARP - On this disk you will find the complete ArpRel3.0 release including the full user docs, the full Developers guide. ARP is the official AmigaDOS Resource Project (ARP) release 1.3. ARP makes many improvements to AmigaDOS and makes your CLI more powerful.
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DD71A&B:C Compiler - This disk contains DICE, Matthew Dillon's full featured, powerful C compiler and environment system. 2 Disks, counts as 2.
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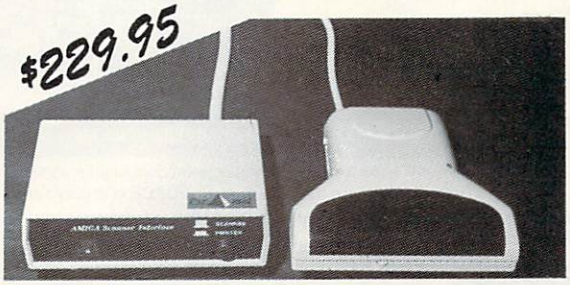
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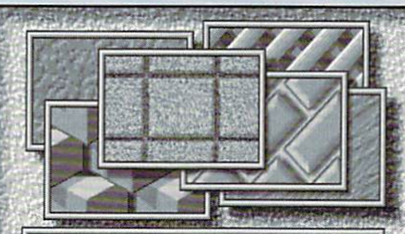
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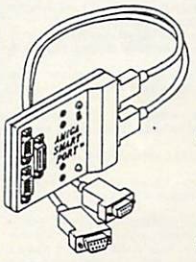
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TSP50: Grinder This useful utility will convert between the following graphics formats: IFF, Ham-E, TIFF, Targa, PCX, Neochrome, Degas, GIF *and* JPeg!
TSP49: Moria This is a vast adventure game that will require hours of dedicated adnturing to crack. You must traverse an absolutely huge world/dungeon to defeae forces of evil. 1 Meg, harddrive installable.
TSP48AB: The A-64 Package This is a complete Commodore 64 emulator. Emulates saphics...everything (no fast loaders or timing-sensitive software.) Works on any Amiga with 1 meg. Two disks, counts as two.
TSP47: Chemesthetics This program will generate calotte models (3D full-color IFF pictecules. Quite beautiful pictures of even the nastiest molecules.
TSP46: Drafting MCad and Plans are both object-oriented drawing/drafting programs (sructured graphics) with all the pribjects you need to create any object. Landscape is a CAD (Computer Aided Design) program for laying out landscapes; once laidout, the computer wilnerate a stylized 3D representation of your landscape.
TSP45: AmigaDOS Replacement Project (ARP) This is the result of a very ambitous project to completely replace all of the AmigaDOS c: commands (DIR, LIST, ASSIGN, INFO, etc.)with more powerful, feature-filled programs. These programs are fully compatable with their Workbench 1.3 counterparts, but also offer many more capabilities--including greatly enhancd wildcard support and more help for each command.
TSP44: MechFite is a role playing game where you control a giant robot and explore worlds, buy or find items, fight against other robots and aliens you are also required to fulfill soma tasnd complete missions.
TSP42: 3D Master Explore the world of 3D modelling with this high-powered software. Create realistic raytraced 3D images. 3D Master is perfect to get your feet wet in 3D. It will require some experimentation to get the most out of it. Req. 1 MB
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TSP39AB: Catacomb A well done graphic dungeon adventure game. Discover the secrets & treasures of the uderground maze and try to stay alive!
TSP38: Virus Utilities VirusX, KillVirus, Virus-Memory Killer, VK360 and ZeroVirusIII will let you sleep at night knowing your Amiga is 1000% virus-free.
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TSP34: MechForce Any number of players can control up to 24 giant robots with lasers, missiles, jump-jets to get you airborne to do battle in teams against each other or against the computer...*highly* addicting!
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TSP26: Directory Utilities Contains all of the best public domain and shareware file and disk utilities available for the Amiga, including UtilMaster, FileMan, M2DU, Sid and DirMaster.
TSP25: SpaceGames Contains MoonBase a very graphically detailed lunar-lander game, SpaceWar-a two player (either in person or over the modem) space battle. Nebula is a 3D world you must defend..definitely commercial quality.
TSP24: Printing Utilities This disk contains a very nice Banner maker that will use any AmigaDOS font with full-color printing. RobsLabelCreator will allow easy creating of labels for your diskettes. PrintStudio allows easy printing of text/graphic images with total control over page numbering/titling, etc.
TSP23AB: Tobias Star Trek A graphic space adventure where you're the captain of your own starship. Travel through the universe, stop the Romulans and Klingons and complete your missions. Two disks, counts as two.
TSP22: 3D Objects This disk contains 18 different vector-objects for use with Sculpt and Imagine. *Some* of the objects include: train engine, synthesizer keyboard, Amiga 3000, space station.



The Intrepid featured on TSP43

TSP21: Disk Duplicators This disk contains all the best utilities to backup diskettes. Included are XCopyIII and NIB which will backup copy-protect programs. Also includes SuperDuper which is an incredibly fast AmigaDOS copier. Freecopy will *remove* copy protection from many popular commercial programs.
TSP20: Board Games Includes Checkers, Dominoes, Clue, Jeopard and Monopoly. Throw away your dice and let your Amiga take care of the details...hours and hours of family fun!
TSP19: PacMan Classics Contains Mazeman, Zonix and PacMan87--all great implementations of the origional arcade classic.
TSP18: MS-DOS Emulation Contains PCTask and IBeM, two shareware IBM-MS Dos emulaturs for your Amiga. Also included are utilities to allow Amiga drives to read/write 720K format MS-DOS disks--Multidos and MSH.
TSP17: Printer Drivers This disk contains over 70 printer drivers for many popular printers.
TSP16: Telecommunication This disk contains two first-class modem programs, NComm and Access. This disk is for the beginner or expert telecommunicator, featuring all the popular communication protocols, including X, Y and Z-Modem. NComm has very advanced script capabilities for performing automated log-ins, downloads and uploads.
TSP15: MED This disk contains the premier music package, MED (Musical EDitor). It will allow you to use digitized sound samples as your instruments and use them in your own songs. Its tremendous editing power makes MED more of a musical word-processor. An extremely well-done program. Many commercial software companies use this package to create soundtracks for their entertainment programs.
TSP14: Plotters This disk contains several of the best mathematical plotting programs available for the Amiga. Includes AmigaPlot--a 3-dimensional mathematical function plotter (pictured), Aplot2.0, and PlotXY
TSP13: Tetris Games This disk contains 6 flavors of the classic game "Tetris." Some have artificial intelligence, others a variety of play-styles/skill levels/number of players.
TSP12: ClipArt This disk contains several excellent bitmapped images for use in Desktop Publishing or similar programs.
TSP11: Operation Desert Storm: This is a complete Hyperbook-type application that will take you through a guided tour of the recent conflict in The Gulf.
TSP10: Fractals Scenery (pictured) will create realistic fractal landscapes. Genesis allows the creation of various landscapes with user-definable levels of complexity. Also included are various Mandelbrot generators, including TMandel, Mandel-Mountains and FracGen.
TSP9: Utilities #1 IconMeister—an Icon editor with a complete set of editing/painting tools. TJFormat—a disk formatting program that will format disks that AmigaDOS wont. ChartMaster—a graphing tool that allows you to generate and save different graphs in IFF format. Graph3D lets you visualize complex data in 3-D and save the results. StructGen lets you create gadgets, text, bitmaps and window structures and the program will automagically write the "C" source code for you. LabelMaker is a very easy to use, full featured label printer. DoublePrint fascilitates printing of text files on both sides of paper.
TSP8: Clipart Black & White and colorful clipart for a variety of needs including desktop publishing/video. People, holiday related, school items, scrolls, food, monsters, fish, lobsters, symbols and lots more.
TSP7: 3D Vector Objects #2 Books, Early American telephone, barrels, gun, spaceships, lamps, trombone, bugle, skateboard, Lego-Rover, remote control, glider and airplane. All objects in Sculpt format.
TSP6: 3D Vector Objects #1 Lamp, mirror, bed, chair, fire hydrant, lamp post, street lamp, street sign, traffic light, cannon, cannon supplies, rose, fork, spoon, knife and plate. All objects in Sculpt format.
TSP5: Games 3 CrossCircuit is a one or two-player action/logic game that requires fast reflexes. WordSearch will allow you to generate your own word-search puzzles. In DrugBusters you rid the streets of cigarettes, alcohol, pills and needles. In Cinco you try to get five X's in a row before your opponent. ColorLogic is an excellent MasterMind type game.
TSP4: Games 2 Dyno-Wars—a strategic checker-style game. Kooties—assemble a bug before the computer beats you to it. BlockBuster is a colorful, well done Tetris-type game. Warrior is a fun shoot'em-up adventure game. MicroMan is a graphic maze game played with a joystick. Battle the computer's armies to take over the planet in Circe.
TSP3: Games 1 Crystal Caverns is an adventure game with randomly generated worlds--you'll never trash the same world twice! Dot2Dot is an adaptation of the classic 2-player connect-the-dot game. PizzaDeliveryMan has you running through the streets to get those pies to your customers. TinyBall is the world's smallest baseball game. Surround-Cycles is a high-speed arcade game, based on the light cycle races from the Disney movie Tron.
TSP2: Sounds Animal sounds, musical instruments and many, many more—43 sound samples in all!
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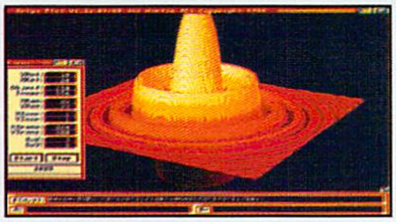
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RK3: 3D Objects an amazing collection of some of the best 3D objects we've ever seen. Also includes texture maps to wrap around some of the objects...1.5MB of data in all! $14.95
RK4: Home Manager This program will help you keep track of your life! Complete address book, appointment scheduler, notepad, auto-dialer (requires modem), areacode utility and complete inventory of all your possessions and credit cards. Extremely useful. Requires 1 Meg. $14.95

TC34AB: Optimizer will permanently speedup your hard-drive or floppy disks. LCD Calc is a nice full-screen calculator. BBaseII is a useful database program. FixDisk will correct many problems with disks. BizCalc is a loan analyser. Interferon is a Tetris-type game. Nebula is a 3D space game. PicBase will allow you to track all the IFF images you have. Hate is a great Zaxxon clone.
TC33AB: Measures 1.0 is an incredibly useful utility that will convert any type of measurement to another. DiskLabeler is a database designed for storing and printing 3." disk labels. Jewels is a Tetris-esque game of action and strategy. Switch is a fun board-game. Gfxclipper will allow you to grab any screen and save it as an IFF picture. Softball Manager is a database for storing stats for softball—any number of leagues may be tracked. WBExec allows you to execute CLI commands from within the Workbench. Several Clipart images are also included.
TC32AB: Computer Coloring Book is a delightful program for children of all ages—comes with 15 pages of pictures to color again and again. Listmaker lets you make, edit, combine and print lists of words—great for those spelling tests! Moresmooth! scrolls text files smoothly on the screen and allows easy printing. Pocket Billiards lets you choose from several of the most popular pool games with realistic action. Texture allows you to create, manipulate and save (in standard IFF format) realistic fractal textured surfaces. Plague is a monster maze game. Also includes Screen Fader, Snowbench, and FlipBench.
TC31AB: Calendar Publisher is a professional-caliber calendar maker that is customizable. CrossCircuit is a 1 or 2 player action/logic game that calls for fast reflexes and thinking. APR is a much-needed printer utility. Pizza Delivery Man is a maze game where you deliver pies in your neighborhood. Multiplayer is a single program that will let you see IFF pictures/brushes or playback IFF sound samples. Also includes RAMgauge, 3-D vector objects and Hi-Res IFF brushes of maps and flags of European countries.
TC26AB: Word Search Maker lets you create word-search puzzles. TimeCalc is useful for anyone who has to calculate hours and minutes (great for adding up times of CD's to make tapes!) Drugbusters is a fun game where you get rid of cigarettes, booze, pills and needles. Wordfinder lets you search binary or text files for a particular word or string (good for getting hints in your adventure games!). KeyClick will add a small audible click to your keys and MouseClick will do the same for the mouse buttons. Seawar is a game between the Allied Navy and the Empire Fleet. Plus Early American 3-D vector objects, digitized sound effects, and a directory program.
TC25AB: ScreenToIFF captures your screen to an IFF file. PopColors lets you change the colors of your Workbench screen. Warrior is a fun shoot'em-up/adventure game for one or two players. Kaleidoscope is a line drawing program. Blockbusters is a game where you get rid of blocks by pushing matching blocks into them. Amidemo will show-off your Amigas ability to do solid-polygon animations. Microscope lets you examine memory at any location. Also includes Hi-Res IFF brushes of all 50 states and 10 Canadian provinces, nine digitized sounds and two small disk utilities and printer utility.
TC24AB: TableMaker is a tool for effortlessly building numerical tables. Kooties is a fun game where you have to assemble a bug before the computer beats you to it. HyperText lets you put links in a text file to other text, graphics, sound, animation, ARexx and other applications. The Little Black Book is a wonderfully useful telephone and address book. Color Logic is a MasterMind-type game. Also includes several disk and memory utilities—and some animal sound effects to top it off.
TC23AB: WhereIs lets you quickly and painlessly find a misplaced file on your drive. Select creates a window from which you can run your favorite programs. MatheMagic lets you find the day of the week for any date in the century, also lets you enter statistical data to be analyzed, graphs data, and solves linear algebraic equations. Pointer List Maker lets you create your own pointers or import pointers from other programs and save them in a disk file. Dyno-Wars requires more strategy and thought than your regular checker board game. Also includes Mr. Monster and Trilion games, 3-D objects, six sound effects and an animation of a pretzel.
TC22AB: Amiga Checkbook is a fast checkbook manager with check printing ability, budget analysis, and a report writer. AmiCrypt is a file encryption/decryption tool to password-protect any file...a must for security. WaveSyn lets you design musical instruments and waveforms for use in other programs. It also lets you play your keyboard like a piano. Cinco is a game where you try to get five X's in a row before your opponent does. AlterCLI lets you change attributes of your CLI window (width, title, depth, height, location, colors) with a single command—very useful for scripts. Also includes an animation by renowned Amiga-artist Lou Markoya, as well as 3-D objects.
TC21AB: Circe is a "risk-style" game where you battle the computer to take over the planet. Batchman allows you to execute CLI programs, batch files and ARexx scripts by simply clicking on a gadget. Colors prints color test sheets and assigns RGB values to printer and screen output....absolutely invaluable to achieve the best color printing results. Easyfile is a powerful database for home or a small business. Sprite Editor lets you easily create animated sprites. Plus 3-D fruit objects and five sampled sounds.
TC16AB: Cyberscape generates complex 3-D vector objects of terrain and saves your objects in Sculpt or Turbo-Silver format. Mathplotter graphs mathematical equations in both 2-D and 3-D. Double Print prints your text files on both sides of the paper. Metamorph, a graphic adventure game, Tinyball—the worlds smallest baseball arcade game and 6 digitized sound effects.



AmigaPlot featured on TSP14

TC15AB: Labelmaker is a very easy to use label program. SurroundCycles, a high-speed arcade game. Dot2Dot, an adaptation of the classical connect-the-dot game. A tutorial on animation techniques by Amiga-artist extrordinaire Brad Schenck complete with one of his animations. Also includes a collection of clip-art and more animal sounds.
TC14AB: AmigoFile is a database and address book. Graph 3-D lets you visualize complex data in a 3-D manner and save the results. Spectrogram analyzes and displays digitized sounds. Pteronadonaball—an animation by Lou Markoya. Also includes 3-D Tic Tac Toe, 3-D objects, food clip-art, and sampled sounds.
TC13AB: StrucGen lets you create gadget, text, bitmap, and window structures and writes the C source code for you. LifeCycles plots your biorhythms. Create spectacular images with Mandelbrots. Look, a CLI utility that helps you find files on your disk quickly and easily. Plus 3-D objects, holiday clip-art, an Amiga Flight animation, drive head cleaning utility, and technical discussion on how AmigaDOS stores information on disk.
TC12: TJFormat formats disks that AmigaDOS normally wont. ChartMaster is a powerful graphing tool. MoreCandy generates an assortment of colorful graphic patterns and allows you to save them to disk. Shark, a game where you have to eat all the little perch you can catch to stay alive. Plus B&W clip-art, spaceship 3-D vector objects, an animation, and Speakeasy (C source code for the programmer to add speech to C programs).
TC11: DiskSalvage will fix corrupted disks and recover deleted files. IconMeister is an advanced Icon editor. AlienDuel is a fast, shoot'em-up game. Crystal Caverns is a colorful, graphic adventure game like the arcade game. Also includes an animation, sound samples, 3D dinner table objects, and Hi-Res monster clip-art.

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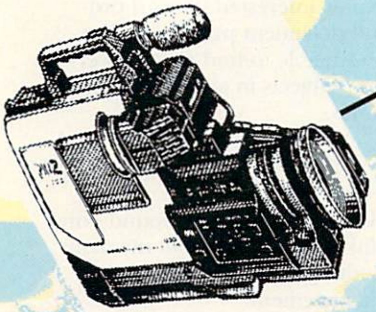
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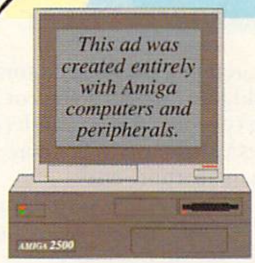
Morph Plus
(From ASDG)
True cinematic quality morphing for the Amiga! That means fast, high quality, easy morphing for your video needs.

EditMaster
DMI has thrust the Amiga head-on into the non-linear editing market with their Digital EditMaster system. Real-time video capture to hard drive and playback are just the start of this amazing solution.

GVP's IV24
GVP has upgraded this excellent product with new bundled software, including **Desktop Darkroom** for image processing, **MyLAD** with a 3-signal, 2-input switcher and 50 transitions, and a new improved version of **MacroPaint**.



Our Solutions are Always Factory Fresh, Fully-Installed and Tested.



SOFTWARE

3D Pro v2.0	239	ProVideo CG II	129
Art Dept. Pro	179	RasterLink	119
Broadcast Titler 2	229	Real 3D TurboPro	259
Caligari2	269	Scala Multimedia 2.0	299
CineMorph	115	Showmaker	229
Deluxe Paint v4.1	109	TV Text Pro	99
Aladin 4D	299	ToastMaster	89
FractalPro v5.0	99	Toaster Toolkit	139
ImageMaster Pro	145	TRexx Pro	79
Imagine v2.0	279	Transporter	159
Pixel 3D	79	Vista Pro v2.0	59
Playmation	379	WipeMaster	129

Any Visa or MasterCard accepted with NO surcharge. Hardware shipping charges vary depending on weight and value. Software shipping charges are $6.00 per total order via UPS Ground to anywhere in the continental USA. All orders over $300 are insured at the customer's expense. All returns require an RA#. Please call before returning anything. All refunds are subject to a usage fee. Ad prices are subject to change without notice.

Federal Express Charges for all orders under 20 pounds; 2nd Day Delivery -- $13; Next Day Delivery -- $17. Canadian and Overseas customers are shipped DHL. Call for rates.

Circle 7 on Reader Service card.

From p. 132.

came from people who responded to the survey, not from me, so your mention of the "author's favorite discs" is not quite accurate. (Due to confidentiality issues, the names of the respondents were not listed in the document.)

Daniel J. Barrett
Amherst, Massachusetts

Can of Worms Dept.

We found your October public-relations piece on the L.A.-based Amiga Video Graphics Guild (AVG) to be misleading. AVG was a SIG of our San Fernando Valley Amiga Users Group (SFVAUG) for two years before it broke away from us following a controversy over the handling of the SIG's finances, among other things. At present, the AVG is a struggling local user's group with considerable management problems to work out; for *AW* to tout the AVG as a national outreach is stretching the definition. But to accompany your piece with a plea for a gigabyte drive donation on their behalf is something else. There are many user's groups across the country that would love *AW* to make hardware pitches for them, including us. We urge you to be more prudent.

SFVAUG Board of Directors
Simi Valley, California

Skip the Politics

Please leave political views out of *AW* and don't divide us into Amiga Republicans and Amiga Democrats. Everywhere I turn I see someone making snide comments about Dan Quayle. *Ha Ha Ha*, real funny. Let's enjoy the best computer in the world *together.*

Jerry Welch
Center, Texas

Not Even Street-Legal

What was the point of "The Ultimate Amiga" feature? I saw the cover and thought, "Great, they souped up a 3000T and are going to tell us how it performed." What do you do with such a hot rod? Mr. Wallace can pack a great machine together and dream about it, but I want one I can put to work.

Jason Koszarsky
Heidelberg, Pennsylvania

My Main Amiga-man

I want to inform you about the excellent service I recently received from an *AW* advertiser. After struggling with several dealers, local and mail order, I called Amigaman (Computer Basics) as a result of their ad. They helped me configure a system, and shipped it the next day, at a price that beat all competition. Later, when I had genlock problems, their service technician spent considerable time helping me. I am glad I found Amigaman.

Tom Madine
Westerville, Ohio

How Far User Friendly?

My husband lost his voice to a progressive terminal disease. So when we heard about the Amiga, with its graphics and voice capabilities, we bought an A500 to try to stave off his depression and give him something enjoyable to do. It was one of the single best investments we have ever made. He became a new person. In no time he was cranking out paintings, melodies, and letters to friends. I have become a "computer widow," but I am not sorry because I owe so much to the Amiga for restoring enjoyment to my husband's life. Soon, however, he will be unable to use the keyboard at all, and I don't know of any accessory that will allow physically impaired people to use the Amiga without the keyboard. Communicating is crucial to a confined person.

Marilyn Scott
St. Petersburg, Florida

> **Why does video have to be more "sizzling" than anything else?**

"If I Ruled the *AmigaWorld*" Dept.

You stated in a previous editorial that you would lose "sizzle" if you cut back on video coverage; I don't understand. Why does video have to be more "sizzling" than anything else?

Ron Cardinale
South San Francisco, California

There are serious video and animation magazines with an Amiga emphasis that people in those fields can turn to for in-depth information. Trying to compete with them is pointless. Focus on broader system coverage, hardware upgrades, product reviews—all that practical consumer stuff that saves us Amiganauts time and money.

Bill Sweetman
Toronto, Ontario

I'm not interested in graphics, paint programs, 3-D, MIDI, or Toasters. I bought my Amiga because it was state-of-the-art in speed, RAM, and operating system, and because no new software was being developed for my old 8-bit computers. There have to be some people out there like me who enjoy programming in Basic. Give us a few pages please!

Thomas Fye
Charleston, West Virginia

I suggest reviewing software with the same standards demanded of PC and Mac software.

Ross Wilkinson
San Francisco, California

Not all of us run our own TV stations!

Dr. Gary Shepard
East Amherst, New York

I am mainly interested in word processing and document publishing, but have not been able to find much coverage of these subjects in any of the Amiga magazines.

David Bertrand
El Cajon, California

In the last three years, I've found only a few useful items in *AW* about my main interests: education and general home use and management.

Jim Schroeder
Berkeley, California

The money needed to do the things you often talk about in your articles adds up to big bucks. Maybe I could justify spending that much if I were a videographer, but I'm not. I'm a teacher. I can't afford to spend thousands on computer products.

Daniel Koch
Atlanta, Georgia

Thanks for telling us that "...[the Amiga] no longer competes with PCs and Macs, but instead takes on workstations from Silicon Graphics, NeXT, and Sun." The next time I'm in the market for a Sun workstation for cranking out letters, managing a database, and playing games, I'll remember: "The Amiga is as good as a Sun, only cheaper."

Richard Boger, Jr.
Rural Hall, North Carolina ■

THE LAST WORD

Kudos, complaints, comments, concerns, and contributions from our readers.

Tarnished Images Dept.

Thank you for mentioning Imagemaster in your October article "Morphing Madness." We do, however, have a great deal of concern that your readers have been misled by some errors it contained. 1) Mr. Swain states, "…with each point moving only a few hundred pixels, it is necessary to use numerous points close together." Incorrect. Imagemaster typically moves many thousands of pixels—it is not always necessary or reasonable to move numerous points close together. 2) Swain says Imagemaster is labor intensive because "…you must set up each frame…individually… to perform each separate morph." But Imagemaster lets the user set up sequential frames using user-modified control vectors from the previous frame. 3) A sidebar declared that Imagemaster does not use vectors, while another upcoming morphing product does. Wrong. Imagemaster uses vectors in a highly sophisticated way. Finally, 4), while two carefully prepared examples from other unreleased products were used, Imagemaster was misrepresented by some distorted and blurry images. (We could have shown you some very impressive images.) We believe you owe it to your readers to be fair, and we feel our product was treated inaccurately.

Ben Williams
VP Engineering, Black Belt Systems
Glasgow, Montana

Seeing Is Believing

There is only one reason why anyone buys a piece of video equipment: to produce the best possible picture. This point was totally absent from the review of our product done by Joel Tessler for *AW's* October Review section. Prime Image's TBC/PCB plug-in board has a K factor measurement of ringing and picture distortion at an unheard-of 1/4 of one percent (most products measure two percent or more), producing superior picture quality. Also ignored in the article was the fact that the Video Toaster has four available inputs for TBCs, but as a result of the required power for each board, only our TBC/PCB's extremely low 5 watts can accommodate it. Mr. Tessler either was not aware of the fact, or chose to overlook it, that direct video processing has long since given way to the modern component processing used by Prime Image.

Bill Hendershot
President, Prime Image
Saratoga, California

I did address the subject of video-picture quality in my review of TBC/PCB: I said that even color bars—a stable *video source—when run through the device displayed almost 20 degrees of phase jitter on a vectorscope. I do not consider that a clean signal. While it is true that the digital FIR filters in the Phillips chipset used on the TBC/PCB will produce the astounding K-factor measurement, I observed other problems with the board—chroma noise and phase jitter, for example—that precluded a "superior quality" judgment on my part. I also feel the mention of 5 watts power consumption is incorrect. Regardless of the spec-sheet claim, the unit I reviewed measured 6.2 watts of power consumption without remote and 6.7 watts with it. Granted, this rating is still lower than the other units I tested it with; I have tested only one other card-based TBC with lower consumption—Digital Creations' Kitchen Sync (3.9 watts per channel). My analysis still leads me to conclude that, of the units I tested, the TBC/PCB does not give the best picture.*

Joel Tessler

The Amiga 4000 is a much more focused machine, and Commodore seems more concentrated on providing solutions for its users.

New Machines; New Mountaintops

I think the Amiga 600 has great potential to steer prospective PC and Nintendo buyers away from those costly alternatives. With a monitor, the 600 is an excellent buy for a 1-meg machine that has great graphics and sound, and a real graphical user interface that doesn't require extra RAM to work well. Besides, good things do come in small packages: remember the C-64?

Marc Chiarello
Oconomowoc, Wisconsin

I was seriously considering switching to the Mac, but wanted to wait until the World of Commodore show in Pasadena to see the A4000. Needless to say, I was surprised by the graphics quality and speed of the new machine; but what really amazed me was Commodore's philosophy behind it. Commodore seems to have a new enthusiasm and dedication to the needs of the user. The Amiga 4000 is a much more focused machine, and Commodore seems more concentrated on providing solutions for its users.

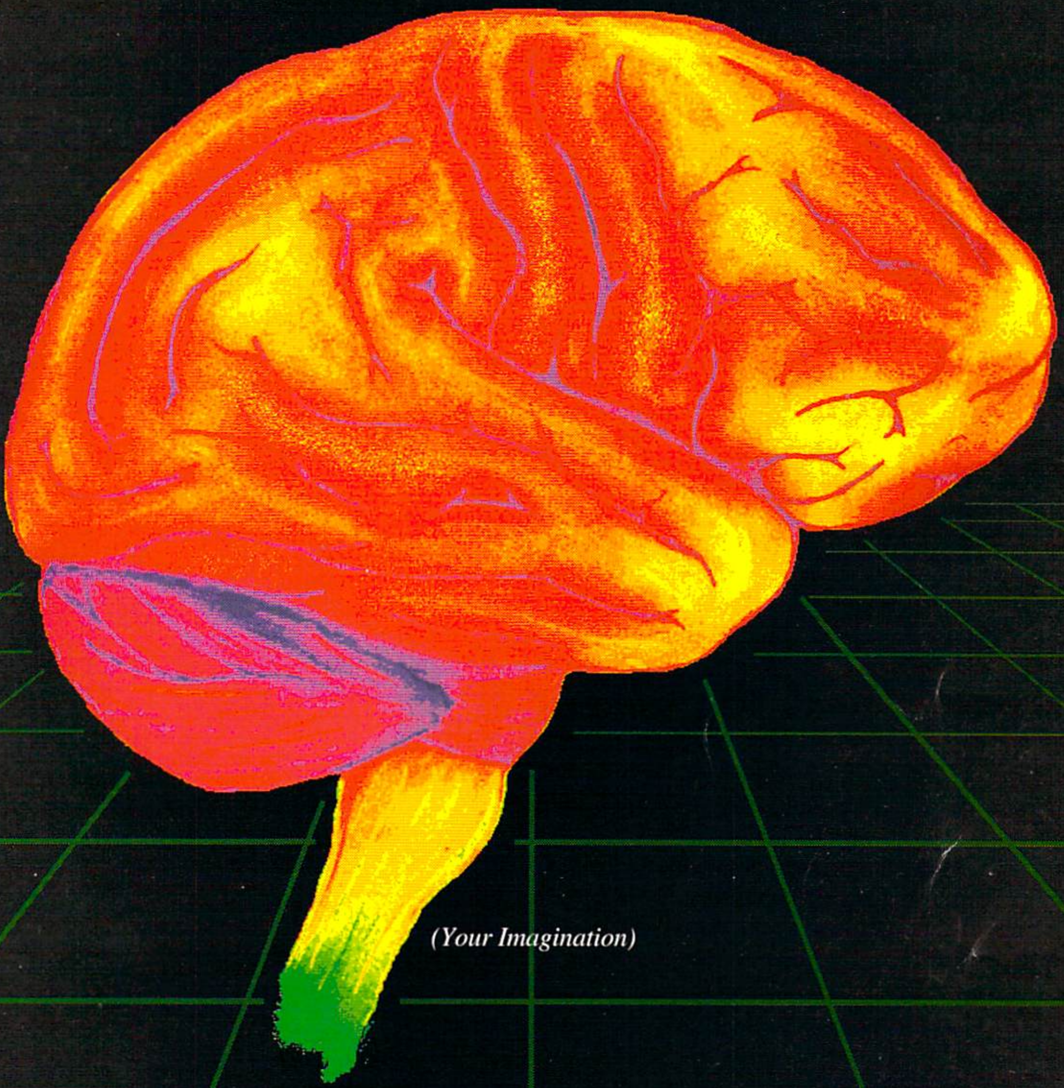
John Bavaresco
Long Beach, California

Roundup Returns

Thank you for mentioning my Amiga CD ROM roundup in September's "On-Line Scan." I would, though, like to add some clarification. The "roundup" is actually a survey that was originally done on USENET, not Portal, as Tim Walsh guessed. Most of the information

Continued on p. 130.

We've Finally Discovered the Limits of CanDo...



(Your Imagination)



CanDo 2.0 is a revolutionary, interactive software authoring environment that lets you take advantage of the Amiga's sophisticated architecture without any technical knowledge.

Powerful, versatile and easy to use, **CanDo 2.0**'s elegant design lets you build anything from a simple slide show to the most advanced, professional application program in a fraction of the time and effort normally associated with program development.

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VIDEO TOASTER™ 2.0

9 essential tools you need if you're using your Amiga for video or graphics.



Digital Video Effects
Real-time digital video effects on live video. From flip, spin and tumble to high-end warping effects.



35ns Character Generator
Scroll, crawl and key professional-quality titles over live video and still images or warp, peel, and spin titles with digital effects.

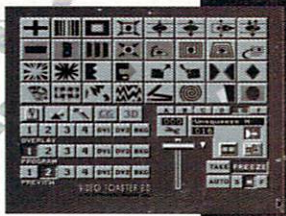


24-bit Broadcast Paint
Create 16 million color images with powerful tools for drawing, tinting, blending, colorizing and warping images.



3D Animation
LightWave 3D is a complete animation system that creates high-resolution 24-bit color images with incredible speed and quality.

4 Input Production Switcher
Perform cuts, fades and wipes between 4 video inputs and 3 internal sources. Now includes amazing new transitions such as fire, liquid and breaking glass.





Dual Frame Buffers
Hold two high-resolution 16 million color video frames in perfect broadcast quality.



Luminance Key
More than just simple weatherman over a map, Toaster keying does luminance fade transitions and even key-based digital trails.



Color Processing
Re-color live video or alter brightness and contrast. Effects include sepia-toning, color-negatives, day-for-night, chrome and more.



Still Store / Frame Grabber
Freeze flawless broadcast resolution images instantly and recall them as sources for the switcher and digital video effects.

The Video Toaster is the world's first all-in-one broadcast-quality video production studio. It's giving everyone from desktop producers to network producers the power of a high-end production studio on a desktop. You've seen the award-winning Toaster used on network television, now you can add the same level of quality and excitement to your videos. Find out why everyone from Time and USA Today to Business Week and Rolling Stone is raving about the Toaster, call for your free Video Toaster tape today.



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